Economic & Social Affairs

The Impact of AIDS

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ST/ESA/SER.A/229

Department of Economic and Social Affairs
Population Division

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PREFACE

The human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) epidemic is one of the major development challenges facing developing countries today. HIV/AIDS is directly threatening the achievement of the eight Millennium Development Goals established following the adoption of the United Nations Millennium Declaration by the General Assembly in its resolution 55/2 of 9 September 2000. In addition to the specific goal of combating HIV/AIDS, the pandemic puts at risk the goals of eradicating poverty, achieving universal primary education, promoting gender equality, reducing child mortality, improving maternal health, ensuring environmental sustainability and creating a global partnership for development.

Soon after the onset of the epidemic, the United Nations Department of Economic and Social Affairs (DESA) Population Division began to study the demography of HIV/AIDS and incorporated the impact of HIV/AIDS into the estimates and projections of national populations. In a continuing effort to expand its activities related to the pandemic, the Population Division has also studied HIV/AIDS behaviour and awareness and has conducted a study on the impact of AIDS on fertility.

The present report considers the broader impact of HIV/AIDS on development. The report reviews the impact of AIDS on households, firms, agriculture, health, education and the macroeconomy.

The report makes extensive use of information and data obtained from and studies conducted by United Nations offices and specialized agencies as well as other institutions dealing with HIV/AIDS. Particular recognition is due to the Joint United Nations Programme on HIV/AIDS and its collaborating agencies (see http://www.unaids.org).

The Impact of AIDS may be accessed on the DESA Population Division World Wide Web site at http://www.un.org/esa/populations/publications.htm. For further information, please contact the office of Mr. Joseph Chamie, Director, Population Division, Department of Economic and Social Affairs, United Nations Secretariat, New York, NY 10017.

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Symbols of United Nations documents are composed of capital letters combined with figures.

The tables presented in this report make use of the following symbols:

Two dots (..) indicate that data are not available or are not separately reported.

An em dash (—) indicates that the amount is nil or negligible.

A hyphen (–) indicates that the item is not applicable.

A minus sign (-) before a figure indicates a decrease.

A full stop (.) is used to indicate decimals.

Use of a hyphen (–) between years, for example, 1995-2000, signifies the full period involved, from 1 July of the first year to 1 July of the second year.

Numbers and percentages in tables do not necessarily add to totals because of rounding.

The following abbreviations are used in the report:

AIDS	acquired immunodeficiency syndrome
AIDSCAP	AIDS Control and Prevention Project
BIDPA	Botswana Institute for Development Policy Analysis
CMH	Commission on Macroeconomics and Health
CGE	computable general equilibrium
EAMAT	Eastern Africa Multidisciplinary Advisory Team
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GNP	gross national product
HEARD	Health Economics and HIV/AIDS Research Division, University of Natal
HIV	human immunodeficiency virus
IAEN	International AIDS Economics Network
ILO	International Labour Organization
IRC	International Water and Sanitation Centre
SAfAIDS	Southern Africa AIDS Information Dissemination Service
STDs	sexually transmitted diseases
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

موجز تنفيذي

إن فيروس نقص المناعة البشرية/الإيدز هو وباء عصرنا الأكثر تدميراً للحياة. فقد راح ضحيته بالفعل ما يربو على 22 مليون شخص، ويوجد حالياً أكثر من 42 مليوناً مصابين به. وحتى إذا اكتُشف الآن لقاح مضاد لفيروس نقص المناعة البشرية فإن ما يناهز 40 مليون شخص سيموتون قبل الأوان رغم ذلك نتيجة للإيدز. ففي بلدان كثيرة، وبخاصة في أفريقيا وفي أشد البلدان نكبة بوباء الإيدز من قبيل بوتسوانا وسوازيلند وزمبابوي، انتشر الوباء بسرعة، مخلفاً في أعقابه المرض والوفاة والفقر والبؤس. وفي بلدان أخرى ما زال الوباء في مراحله الأولى. ومن الجدير بالملاحظة أن فيروس نقص المناعة البشرية/الإيدز أصبح مترسخاً الآن في أشد بلدان العالم اكتظاظاً بالسكان - فقد بلغ عدد المصابين بفيروس نقص المناعة البشرية/الإيدز مليون شخص في الصين وستة ملايين في الهند، وبدأ فعلاً الإحساس في هذين البلدين بتأثيرات الوباء المدمرة.

والوباء لم يقتل الناس فحسب؛ بل فرض عبئاً ثقيلاً على العائلات والمجتمعات المحلية والاقتصادات. والبؤس والدمار اللذان تسبب فيهما بالفعل فيروس نقص المناعة البشرية/الإيدز هائلان، ولكن من المرجح أن أثره في المستقبل سيكون أكبر حتى من ذلك، مع استمرار تزايد قائمة البلدان المنكوبة به بشدة. ومن الصعب التنبؤ على وجه اليقين بمسار الوباء في المستقبل. إذ يتوقف الكثير على ما يلي:

- توعية الناس بأخطار الفيروس وحثهم على تغيير سلوكياتهم
- إيجاد طرائق فعالة للحيلولة دون زيادة انتشار الفيروس
- اكتشاف أدوية وعلاجات جديدة
- تعبئة الموارد المالية والبشرية اللازمة لإنجاز هذه المهام

وقد بدأت شعبة السكان التابعة لإدارة الشؤون الاقتصادية والاجتماعية، بعد بدء ظهور وباء فيروس نقص المناعة البشرية/الإيدز مباشرة، في دراسة أبعاده الديموغرافية وأدمجت أثر فيروس نقص المناعة البشرية/الإيدز ضمن التنقيحات التي تجري كل سنتين لتقديرات

وإسقاطات الأمم المتحدة الرسمية بشأن عدد سكان العالم[1]. ويمضي هذا التقرير أبعد من ذلك فيتناول آثار فيروس نقص المناعة البشرية/الإيدز الأوسع نطاقاً على التنمية. ويوفر التقرير مُدخلاً للدورة الثامنة والثلاثين للجنة السكان والتنمية، التي ستجتمع في سنة 2005، وسيكون موضوع دورتها تلك هو "السكان والتنمية وفيروس نقص المناعة البشرية/متلازمة نقص المناعة المكتسب (الإيدز)، مع التركيز الخاص على الفقر". كما أنه يقدم عرضاً عاما لمختلف عواقب وباء الإيدز من أجل الاستعراض الذي ستجريه الجمعية العامة في سنة 2005 لتنفيذ إعلان الالتزام بشأن فيروس نقص المناعة البشرية/متلازمة نقص المناعة البشرية (الإيدز)، الذي اعتُمد في سنة 2001 (A/RES/S-26/2).

، إلى جانب تحليل الأثر الديموغرافي لفيروس نقص المناعة البشرية/الإيدز، أثر فيروس نقص المناعة البشرية/الإيدز على العائلات والأسر المعيشية، وعلى الاستدامة الزراعية، وقطاع الأعمال، وقطاع الصحة، والتعليم، والنمو الاقتصادي الوطني. فقد محا فيروس نقص المناعة البشرية/الإيدز عقوداً من التقدم في الحد من الوفيات السابقة لأوانها وأدى إلى تعريض ظروف حياة الأجيال الحالية والمقبلة لخطر بالغ. ويخلّف الوباء أثراً مذهلاً لأنه يُضعف ويقتل أشخاصاً كثيرين وهم في ميعة الشباب، أي في أكثر سنوات العمر إنتاجاً لإدرار دخل ولرعاية الأسرة. فهو يدمر الأسر، ويقضي على جيل بأكمله ينطوي وجوده على أهمية حاسمة لبقاء صغار السن والمسنين في المجتمع على قيد الحياة.

لقد ترك فيروس نقص المناعة البشرية/الإيدز بالفعل أثراً ديموغرافياً مدمراً، وبخاصة في أفريقيا جنوب الصحراء. فقد أسفر الوباء عن خسائر مروعة في الأرواح وفي أعداد السكان. وتبين

(1) التوقعات السكانية في العالم: تنقيح عام 2002 (الأمم المتحدة، إدارة الشؤون الاقتصادية والاجتماعية، شعبة السكان، رقم المبيع E.03.XIII.6).

إسقاطات الأمم المتحدة السكانية الحديثة العهد أن الخسائر ستكون أفدح حتى من ذلك على مدى العقود المقبلة.

2002 ، وهي تقديرات وإسقاطات الأمم المتحدة الرسمية بشأن سكان العالم، تأثيرات فيروس نقص المناعة البشرية/الإيدز فيما يتعلق بأشد البلدان نكبة به ومجموعها 53 بلداً. فتلك البلدان يعيش فيها أكثر من 90 في المائة من البالغين المصابين بفيروس نقص المناعة البشرية/الإيدز. وقد بلغ العدد السنوي للوفيات الزائدة في تلك البلدان الثلاثة والخمسين، مليوناً بحلول أوائل تسعينات القرن العشرين، وبلغ 3 ملايين بحلول سنة 2000، وتجاوز 4 ملايين بحلول سنة 2003.

وتقع ثمانية وثلاثون بلداً من هذه البلدان الثلاثة والخمسين - أي ثلاثة من كل أربعة - في أفريقيا جنوب الصحراء. ومن المتوقع حدوث نحو 100 مليون حالة وفاة إضافية في تلك البلدان الأفريقية بحلول سنة 2025 نتيجة لوباء فيروس نقص المناعة البشرية. وبحلول سنة 2025 سيقل عدد سكان تلك البلدان بنسبة 14 في المائة عما كان سيصبح في حالة عدم وجود الإيدز. وعلى الرغم من أن التأثيرات الديموغرافية لفيروس نقص المناعة البشرية/الإيدز في البلدان الواقعة خارج أفريقيا معتدلة نسبيا وأن معدلات شيوع الوباء فيها أقل، فإن الخسائر البشرية تظل هائلة رغم ذلك. ومن المتوقع أن يؤدي الإيدز قبل حلول سنة 2025 إلى 31 مليون حالة وفاة إضافية في الهند و 18 مليون حالة وفاة إضافية في الصين.

وقد تصاعدت معدلات الوفيات في البلدان التي ترتفع فيها معدلات شيوع فيروس نقص المناعة البشرية، بحيث ارتفعت في غضون عقد واحد إلى مستويات لم تُشهد منذ خمسينات أو ستينات القرن العشرين. وفي أشد البلدان الأفريقية تأثرا بذلك ومجموعها 38 بلدا، ستكون قرابة عشر سنوات من العمر المتوقع قد فُقدت بحلول الفترة 2020-2025، وفي البلدان السبعة التي توجد فيها أعلى معدلات لشيوع الوباء، ستكون قرابة 30 سنة قد فُقدت. أما خارج أفريقيا، فمن بين البلدان التي من المتوقع أن تشهد انخفاضا كبيرا في متوسط العمر المتوقع جزر البهاما وكمبوديا والجمهورية الدومينيكية وهايتي وميانمار.

ويوجد في بوتسوانا حاليا أعلى معدل لشيوع فيروس نقص المناعة البشرية في العالم: إذ أن أكثر من واحد بين كل ثلاثة من البالغين فيها مصاب بفيروس نقص المناعة البشرية. وقد بلغ متوسط العمر المتوقع 65 سنة في الفترة 1990-1995، ولكنه انخفض إلى 56 سنة بحلول الفترة 1995-2000 وأصبح الآن حوالي 40 سنة نتيجة للوفيات المرتبطة بالإيدز. ومن المرجح أن عدد السكان سينخفض في غضون بضع سنوات. ومع أن الأثر الاقتصادي الكامل لفيروس نقص المناعة البشرية/الإيدز لم يتضح بعد، يتبيّن من الاسقاطات السكانية لبوتسوانا حدوث عجز شديد لديها بحلول سنة 2025 في عدد سكانها ممن هم في سن العمل.

تشعر الأسر المعيشية بالأثر الفوري لوباء فيروس نقص المناعة البشرية/الإيدز. بل إن الأسر المعيشية والعائلات هي، في حقيقة الأمر، التي تتحمل معظم العبء بالنظر إلى أنها الوحدات الأولية لمواجهة المرض وعواقبه. وتعاني ماليا العائلات التي يكون الشخص المصاب فيها بالمرض هو عائلها، وذلك من جرّاء فقدان الدخل إلى جانب زيادة نفقات الرعاية الطبية. وأثناء فترة المرض الطويلة، يؤدي فقدان الدخل إلى جانب رعاية أحد أفراد العائلة إلى إفقار الأسر المعيشية. وتوثق الدراسات انخفاض مستويات استهلاك الأسر المعيشية، ومن بينه انخفاض استهلاك الأغذية، مما يؤدي إلى سوء التغذية. ويطرح وباء فيروس نقص المناعة البشرية/الإيدز تحديات إضافية في الأماكن التي ينطوي فيها المرض على وصمة اجتماعية شديدة الوطأة.

والعدوى بفيروس نقص المناعة البشرية أكثر شيوعا بين صغار البالغين، بحيث يُفقد قطاع كبير من جيل الآباء والأمهات صغار السن، ويتعرض تكوين الأسرة لتغييرات سريعة. فالبلدان الأشد نكبة بالوباء تشهد زيادات في النسبة المئوية للأسر المعيشية التي تعيلها أناث وفي الأسر المعيشية التي يعيلها الأجداد، فضلا عن الأسر المعيشية التي يعيلها أيتام صغار السن. وعندما يموت أحد أفراد العائلة، قد تتفكك الأسرة المعيشية تماما، وقد يُرسل الأطفال ليعيشوا مع أقاربهم أو قد يُتركون حتى بمفردهم.

ويكون لوفاة زوج أثر شديد على وجه الخصوص في المجتمعات التي يوجد فيها تقسيم ملحوظ للعمل بين الجنسين وذلك بالنظر إلى أن الزوج الذي يبقى على قيد الحياة لا يستطيع أن يتولى الأعمال أو المسؤوليات التي كان يقوم بها فرد الأسرة المريض أو المتوفي. ففي مقاطعة راكاي بأوغندا، مثلا، أدت الوفيات الناجمة عن الإيدز إلى حدوث نقص في اليد العاملة اللازمة لكل من العمل في المزرعة والعمل المنزلي.

وبحلول سنة 2001 كان 14 مليون طفل دون سن الخامسة عشرة قد فقدوا أحد والديهم أو كليهما بسبب فيروس نقص المناعة البشرية/الإيدز. ويعيش أحد عشر مليونا من هؤلاء الأطفال في أفريقيا جنوب الصحراء. ومن المرجح أن تتضاعف الأعداد بحلول سنة 2010. ومن الشائع أن يأخذ الأقارب اليتامى إلى منازلهم، وبخاصة في المجتمعات الأفريقية، ولكن سرعة زيادة عدد اليتامى ستكون فوق طاقة نظام الدعم التقليدي الذي تمثله الأسرة الممتدة. وكثرة من الأسر المعيشية التي ترعى يتامى هي نفسها فقيرة، وتمثل رعايتها للأطفال الذين أصبحوا يتامى عبئا كبيرا.

يؤثر المرض على مشاريع الشركات في كل من القطاعين الزراعي وغير الزراعي. وتشير الدراسات المتاحة عن أثر فيروس نقص المناعة البشرية/الإيدز إلى آثاره على حجم ونوعية القوى العاملة وعلى تكاليف العمل، لأن أكثر العمال إنتاجا يسقطون فريسة للمرض بحيث يتعذر عليهم أن يعملوا بفعالية، ويموتون في نهاية الأمر. وقد ترك فقدان العمال من جراء الإيدز إلى جانب تكلفة تقديم استحقاقات الرعاية الصحية واستحقاقات الوفاة تأثيرات شديدة على أصحاب العمل.

وأثر الإيدز على الشركات يتوقف أساسا على خمسة عوامل هي: عدد العاملين المصابين؛ ودورهم في الشركة؛ وهيكل عملية الإنتاج وقدرتها على التأقلم مع فقدان العاملين؛ واستحقاقات الرعاية الصحية التي تقدمها الشركة؛ وتأثير فيروس نقص المناعة البشرية/الإيدز على ظروف العمل. ففي مراحل المرض الأولى، غالبا ما يكون باستطاعة العمال مواصلة العمل ولكنهم يحصلون على مزيد من الإجازات المرضية ويتغيبون عن العمل بدرجة أكبر. وقد لا يكون

باستطاعة الشركات التي تقدم استحقاقات رعاية صحية للعمال وأسرهم أن تتحمل تكاليف الرعاية الصحية والأدوية الباهظة الثمن التي تُتعاطى لعلاج فيروس نقص المناعة البشرية/الإيدز. فقد وجدت دراسة أجريت في ملاوي، مثلا، أن وفيات العمل في إحدى الشركات زادت بنسبة تجاوزت 40 في المائة على مدى فترة خمس سنوات، مما أدى إلى دفع استحقاقات وفاة أعلى كثيرا.

والأرجح أن يصاب بعدوى فيروس نقص المناعة البشرية صغار البالغين الذين يكونون في أوج سنوات العمل، ومن الأرجح أن يموت العمال الأصغر سنا بسبب الإيدز بدرجة غير متناسبة. ويعاني الإنتاج وتعاني الإدارة تبعا لمواقف العمال المصابين. فالعمال ذوو المهارات غير العادية وذوو الخبرة الأطول يكون من الأصعب أن يحل محلهم أحد. وفي الوقت ذاته، قد ينخفض الطلب على السلع والخدمات لأن الأسر المعيشية المنكوبة بالمرض يقل دخلها وتقل مستويات استهلاكها.

يترك فيروس نقص المناعة البشرية/الإيدز تأثيرا مدمرا على الإنتاج الزراعي وعلى قدرة المزارع والمشاريع الزراعية التجارية الصغيرة على الاستمرار اقتصاديا. فقد وجدت منظمة الأمم المتحدة للأغذية والزراعة أن قوة العمل الزراعية في البلدان الأفريقية العشرة الأشد نكبة بفيروس نقص المناعة البشرية/الإيدز ستنخفض بنسبة تتراوح بين 10 و 26 في المائة بحلول سنة 2020. ومن المتوقع أن تفقد كل من بوتسوانا وموزامبيق وناميبيا وزمبابوي خُمس عمالها الزراعيين على الأقل.

ومن بين عواقب فقدان عمال المزارع حدوث انخفاض في الأراضي المزروعة، والتحول إلى زراعة المحاصيل التي تتطلب عددا أقل من الأيدي العاملة، وحدوث انخفاض في غلات المحاصيل وعجز في اليد العاملة أثناء فترات ارتفاع الطلب على اليد العاملة. ويؤدي الوباء إلى فقدان معارف بشأن أساليب الزراعة وحدوث انخفاض في اليد العاملة الماهرة والمتمرسة. فقد وجدت دراسة استقصائية أُجريت في زمبابوي أن الإنتاج الزراعي انخفض بزهاء 50 في المائة بين الأسر المعيشية المنكوبة بالإيدز. وركزت دراسة أخرى على القطاع

الزراعي التجاري في كينيا؛ وأفادت بأن حالات الاعتلال والوفاة المرتبطة بالإيدز فرضت بالفعل تكاليف مالية واقتصادية واجتماعية فادحة.

لقد كانت نظم الرعاية الصحية لا تفي بالمراد أصلاً في كثير من البلدان التي تأثرت بشدة بوباء فيروس نقص المناعة البشرية/الإيدز حتى قبل أن تُنكب به. فقد فرض فيروس نقص المناعة البشرية/الإيدز أعباءً إضافية هائلة على هذه النظم، مما أجهد الميزانيات الصحية ونظم التأمين الصحي. وفي الوقت ذاته، يسقط أيضاً العاملون في مجال الرعاية الصحية فريسة للمرض ويموتون. ومن ثم، يُستنزف المعروض من الخدمات الصحية المتاحة بينما يتزايد الطلب على تلك الخدمات.

وأخذت نفقات علاج الإيدز تتزايد، وكذلك الأخماج الشائعة بين الأشخاص الذين تكون أجهزتهم المناعية قد ضعُفت من جراء فيروس نقص المناعة البشرية/الإيدز. وكان معنى تخصيص الموارد الشحيحة لعلاج فيروس نقص المناعة البشرية/الإيدز هو حصول الشواغل الصحية الأخرى على اهتمام أقل. ومع زيادة الضغط على الحكومات في مواجهة وباء الإيدز لكي توفر الرعاية الصحية عن طريق القطاع العام، يتعين على القطاع الخاص وعلى الأسر المعيشية والأفراد تحمُّل تكاليف الرعاية الصحية بدرجة متزايدة.

يؤدي فيروس نقص المناعة البشرية/الإيدز إلى تآكل المكاسب التي تحققت نحو تحقيق هدف توفير التعليم الابتدائي للجميع. فالإيدز يُضعف النظم التعليمية ويعوق انتظام الأطفال في المدارس. وقد يؤدي وباء الإيدز، على المدى الطويل، إلى حدوث انخفاض في مستوى نوعية التعليم، مما يؤدي إلى تضاؤل رأس المال البشري، وإلى تأخير التنمية الاجتماعية والاقتصادية.

وقد تبيَّن من دراسات وجود معدل مرتفع للإصابة بفيروس نقص المناعة البشرية بين المدرسين ومديري المدارس، مما يؤثر على كل من مقدار الموارد التعليمية ونوعيتها. ومن الصعب أن تجري

عملية إحلال للمدرسين المدربين والمتمرسين. فقد قدرت دراسة أجرتها منظمة الأمم المتحدة للطفولة (اليونيسيف) أن عدد وفيات المدرسين في زامبيا في سنة 1998 كان يعادل فقدان نحو ثلثي الناتج السنوي للمدرسين المدربين حديثاً. ويحل، بحكم الضرورة، محل المدرسين المتمرسين مدرسون أقل تمرساً؛ ونتيجة لذلك تتدنى نوعية التعليم. كما تضعُف النوعية أيضاً عندما يؤدي تغيُب المدرسين إلى تعطل عملية تعلُّم تلاميذهم.

وفي الوقت ذاته، تبيِّن دراسات أن أطفال العائلات التي يوجد فيها فرد مصاب بالوباء تكون احتمالات بقائهم في المدرسة أقل. فأولئك الأطفال تكون ثمة حاجة إليهم أُسريا إما ليساعدوا في الأعمال المنزلية أو ليعملوا. والعائلات الأرق حالاً تكون غير قادرة على دفع الرسوم المدرسية. فقد وجدت دراسة أُجريت في مقاطعة من مقاطعات أوغندا منكوبة بالوباء بشدة أن معدلات القيد الإجمالية في ثلاث مدارس ابتدائية انخفضت بنسبة 60 في المائة في الفترة من عام 1989 إلى عام 1993. كما أن الأيتام الذين فقدوا كلا والديهم تكون أيضاً احتمالات انتظامهم في المدارس أقل كثيراً من احتمالات ذلك فيما يتعلق بالأطفال الآخرين. وقد أفادت دراسة استقصائية للأسر المعيشية أُجريت في كمبالا، أوغندا، بأن 47 في المائة من الأسر المعيشية التي كان لديها أيتام في سنة 1990 لم يكن لديها ما يكفي من النقود لإرسال أطفالها إلى المدارس، بالمقارنة بنسبة قدرها 10 في المائة في حالة الأسر المعيشية الأخرى.

إن وباء فيروس نقص المناعة البشرية/الإيدز يُثقل كاهل اقتصاد أي بلد. ويصدق هذا بالذات على الاقتصادات الضعيفة التي تتسم بها عموماً البلدان التي توجد فيها مستويات مرتفعة لشيوع الإصابة بفيروس نقص المناعة البشرية. فقد أُجريت دراسات في كثير من البلدان المنكوبة بالوباء بشدة لوضع نماذج لأثر فيروس نقص المناعة البشرية/الإيدز على النمو الاقتصادي. وفي بعض الحالات كانت تقديرات الأثر الاقتصادي لفيروس نقص المناعة البشرية/الإيدز "صغيرة". أما في حالات أخرى فقد تبين حدوث انخفاضات سنوية تتراوح من نقطتين مئويتين إلى 4 نقاط مئوية من الناتج المحلي

الإجمالي كل سنة، بالمقارنة بحالة "عدم وجود الإيدز" الافتراضية. ومن المرجح أن يؤدي وباء فيروس نقص المناعة البشرية/الإيدز، إلى جانب تأثيراته على الناتج المحلي الإجمالي، إلى تفاقم انعدام المساواة في الدخل وإلى زيادة الفقر.

ومن المؤكد أن أثر فيروس نقص المناعة البشرية/الإيدز على الرفاه والتنمية على المدى الأطول أخطر مما تشير إليه التحليلات الاقتصادية. فتقديرات آثار الإيدز على الأداء الاقتصادي لا تأخذ في الحسبان عادة فقدان "رأس المال الاجتماعي" أو الضرر الذي يلحق برأس المال البشري على المدى الطويل، مع تأثر تعليم الأطفال وتغذيتهم وصحتهم تأثراً مباشراً وتأثراً غير مباشر نتيجة لفيروس نقص المناعة البشرية/الإيدز. وسوف تؤثر تأثيرات انخفاض الاستثمار في رأس المال البشري للجيل الأصغر سناً على الأداء الاقتصادي لعدة عقود مقبلة، بما يتجاوز إلى حد كبير الإطار الزمني لمعظم التحليلات الاقتصادية.

لقد اعتمدت الجمعية العامة، بقرارها 26-إ/2 (المرفق)، في دورتها الاستثنائية السادسة والعشرين، المعقودة في نيويورك في الفترة من 25 إلى 27 حزيران/يونيه 2001، إعلان التزام بشأن فيروس نقص المناعة البشرية/الإيدز. وقد جاء في الإعلان أن "وباء فيروس نقص المناعة البشرية/الإيدز العالمي يمثل، بنطاقه وأثره المدمرين، حالة طوارئ عالمية وتحدياً من أشق التحديات لحياة الإنسان وكرامته، وللتمتع الفعلي بحقوق الإنسان، مما يقوض التنمية الاجتماعية والاقتصادية في جميع أنحاء العالم، ويؤثر في المجتمع على جميع مستوياته الوطنية والمحلية والأسرية والفردية ".

ومنذ اعتماد إعلان الالتزام، تفاقم وباء فيروس نقص المناعة البشرية/الإيدز وأصبح أكثر انتشاراً. ويؤكد تقرير الأمين العام المقدم إلى الدورة الثامنة والخمسين للجمعية العامة بشأن التقدم المحرز في تنفيذ إعلان الالتزام بشأن فيروس نقص المناعة البشرية/الإيدز أن القيادة السياسية الحازمة والعمل الفعال أمران ضروريان لمنع تفشي فيروس نقص المناعة البشرية/الإيدز تفشياً كبيراً. ويوصي التقرير بأن تضع البلدان كافة وتنفذ استراتيجيات وطنية لتوفير خدمات شاملة من

حيث الوقاية والعلاج والرعاية والدعم للمصابين بفيروس نقص المناعة البشرية/الإيدز.

وستلزم جهود وموارد أكبر كثيراً للتغلب على فيروس نقص المناعة البشرية/الإيدز. وكما استنتج الأمين العام في تقريره، "لتمويل الاستجابة العالمية ... يجب أن يزيد التمويل السنوي لبرامج فيروس نقص المناعة البشرية/الإيدز بمقدار ثلاثة أمثال بحلول سنة 2005 وبمقدار 7 أمثال بحلول سنة 2007 مقارنة بالمستويات الحالية".

ومسار وباء فيروس نقص المناعة البشرية/الإيدز ليس محدداً سلفاً على الإطلاق. فمساره في نهاية الأمر يتوقف على كيفية استجابة الأفراد والمجتمعات والدول والعالم لتهديد فيروس نقص المناعة البشرية/الإيدز اليوم وغداً.

执行摘要

艾滋病毒/艾滋病是当今最致命的流行病。迄今已有 2 200 万人丧生，4 200 多万人感染艾滋病毒/艾滋病。即使今天发现了艾滋病毒的疫苗，也还会有 4 000 多万人因艾滋病毒而过早夭折。在许多国家，特别是在非洲以及博茨瓦纳、斯威士兰和津巴布韦等受影响最严重的国家，艾滋病已迅速蔓延，带来疾病、死亡、贫穷和苦难。在其他国家，艾滋病尚处于早期阶段。值得注意的是，艾滋病毒/艾滋病已占据世界上人口最多的国家生根——在中国，感染艾滋病毒的人数已达 100 万，在印度已达 600 万；现这两个国家已开始感到该流行病的破坏作用。

这种流行病不仅致命，而且给家庭、社区和经济带来沉重负担。艾滋病毒/艾滋病已带来的苦难和破坏是巨大的，但今后的影响看来会更大，因为受到相当影响的国家在继续增多。很难肯定地预测该流行病的未来走向。这在很大程度上取决于：

- 教育人们认识该病毒的危险，劝告他们改变行为方式
- 找出有效的方法防止病毒的进一步传播
- 发现新的药品和治疗方法
- 调动完成这些任务所必须的财力和人力资源

经济和社会事务部人口司在流行病发生后不久即着手研究艾滋病毒/艾滋病的人口学，并在两年一次订正联合国对世界人口的正式估计和预测时纳入了艾滋病毒/艾滋病的影响的内容。[1] 本报告则更进一步，对艾滋病毒/艾滋病对发展的更广泛的影响进行了审查。报告将为人口与发展委员会 2005 年召开的第三十八届会议（主题将是“人口、发展与艾滋病毒/艾滋病，特别着重贫穷问题”）提供投入。报告也将为大会在 2005 年审查 2001 年通过的《联合国关于艾滋病毒/艾滋病问题的承诺宣言》（A/RES/S-26/2）的实施情况提供关于艾滋病流行病的全部影响的概览。

《艾滋病的影响》除了分析艾滋病毒/艾滋病的人口影响外，还突出显示了艾滋病毒/艾滋病对家庭和住户的影响以及对农业的可持续性、商业、保健部门、教育和国家经济增长的影响。艾滋病毒/艾滋病流行病抹杀了几十年来在降低死亡率方面取得的进展，并严重影响了今世后代的生活条件。这种病的影响令人惊骇，因为它使许多青年人在赚取收入和抚养家庭的大好时光丧失体力以至生命。艾滋病破坏家庭，毁掉对社会中的幼者和长者生存至关重要的一代人。

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[1] 《世界人口前景：2002 年修订本》（联合国经济和社会事务部人口司出版物，销售号 E.03.XIII.6）。

艾滋病毒/艾滋病的人口影响

艾滋病毒/艾滋病已造成摧毁性的人口影响，尤其是在撒哈拉以南非洲。流行病导致生命和人口的重大损失。联合国最近的人口预测显示，今后几十年的损失会更大。

《世界人口前景：2002 年修订本》是联合国对世界人口的正式估计和预测，其中述及艾滋病毒/艾滋病在 53 个最严重国家中的影响。90%以上的艾滋病毒感染者生活在这 53 个国家。到二十世纪九十年代初，这 53 个国家中每年多死亡的人数已达 100 万，到 2000 年已达 300 万，到 2003 年已达 400 万以上。

53 个国家中有 38 个（占四分之三）位于撒哈拉以南非洲。预期到 2025 年，这些非洲国家会因艾滋病毒流行病而多死亡一亿人左右。到 2025 年，这些国家将会比没有艾滋病的情况少 14%的居民。

尽管艾滋病毒在非洲以外国家对人口的影响相对和缓，传染率也较低，但人口损失依然很大。在 2025 年之前，预期艾滋病将使印度多死亡 3 100 万人，使中国多死亡 1 800 万人。

在艾滋病毒感染率高的国家，死亡率剧增，仅十年之间就达到了二十世纪五十年代或六十年代以来所未见的水平。在 38 个受影响最严重的非洲国家，到 2020-2025 年，将损失近 10 年的预期寿命，在 7 个感染率最高的国家，将损失将近 30 年。在非洲以外，预计人口预期寿命将显著下降的国家包括巴哈马、柬埔寨、多米尼加共和国、海地和缅甸。

博茨瓦纳的艾滋病毒感染率目前居世界之首：每三个成年人中就有一个以上是艾滋病毒阳性。1990-1995 年时预期寿命已达 65 岁，但由于艾滋病造成的死亡，到 1995-2000 年降到 56 岁，目前为 40 岁左右。人口可能在几年内开始减少。尽管艾滋病毒/艾滋病的全部经济影响还有待显示，但博茨瓦纳的人口预测显示，到 2025 年劳动力将严重不足。

艾滋病毒/艾滋病对住户和家庭的影响

住户首先感到艾滋病毒/艾滋病的影响。事实上，住户和家庭承受的负担最重，因为它们是对付疾病及其后果的首要单位。患病者为养家者的家庭会因丧失收入和增加医药开支而产生经济困难。在生病的长时期内，损失的收入和护理一名家庭成员的费用使家庭陷入贫困。研究表明，家庭的消费减少，包括食品消费减少，导致营养不良。在艾滋病毒/艾滋病患者在社会上被另眼看待的地方，该流行病造成的挑战就更严重。

由于艾滋病毒感染在青壮年中最普遍，因而年轻父母一代中有相当一部分夭折，家庭结构也随之迅速变化。在受害严重的国家，女户主和祖辈当家的家庭比例增加，还有年幼的孤儿当家的住户。当某个家庭成员死亡时，该家庭也许就分崩离析，孩子或被送往亲戚家，或得自己照顾自己。

在男女分工明显的社会里，配偶死亡带来的影响尤其严重，因为未亡人无法接手已生病或亡故的家庭成员的工作或责任。例如，在乌干达拉卡伊地区，因艾滋病造成的死亡已经使农业劳动和家务工作出现劳动力短缺的情况。

截至 2001 年，已有 1 400 万 15 岁以下的儿童因艾滋病毒/艾滋病而失去单亲或双亲。这些儿童中有 1 100 万生活在撒哈拉以南非洲。到 2010 年，这些数字可能会加倍。特别是在非洲社会，亲戚常常把孤儿领回自己的家里，但是迅速增长的孤儿人数会使传统的大家庭支助体系无法承受。许多领养孤儿的家庭本身也很贫穷，接纳孤儿是一大负担。

艾滋病毒/艾滋病对公司的影响

该病影响到农业部门和非农业部门的工商企业。关于艾滋病毒/艾滋病影响的现有研究指出了此病对劳动力的数量和质量的影响以及对劳动力成本的影响，因为最有生产能力的工人病得不能有效工作或根本不能工作，及至死去。因艾滋病损失的工人以及提供保健福利和死亡抚恤金的费用对雇主产生严重影响。

对公司的影响主要取决于五个因素：感染的雇员人数、他们在公司中的作用、生产程序的结构及其应付雇员损失的能力、公司提供的保健福利、艾滋病毒/艾滋病对企业环境的影响。在生病初期，工人常常可以继续工作，但是病假和请假时间增多。为工人及其家属提供保健福利的公司也许无法支付保健费用和用来治疗艾滋病毒/艾滋病的昂贵药物。例如，在马拉维进行的一项研究发现，五年中一个公司的工人死亡人数增加 40%以上，使支付的死亡抚恤金大幅度上升。

正当盛年的青年人最可能感染艾滋病毒，在最有可能死于艾滋病的人中，较年轻工人人数之多是不成比例的。生产和管理所受的影响视受感染工人从事的工作而定。具有卓越技能和较多经验的工人最难替代。同时，由于受影响的家庭收入减少，消费水平下降，对货物和服务的需求可能减少。

艾滋病毒/艾滋病对农业的影响

艾滋病毒/艾滋病正在摧毁农业生产以及小农和商业农业企业的经济。联合国粮食及农业组织(粮农组织)发现，在艾滋病毒/艾滋病影响其严重的 10 个非洲国家中，农业劳动力到 2020 年将减少 10%到 26%。预期博茨瓦纳、莫桑比克、纳米比亚和津巴布韦各将丧失至少五分之一的农业工人。

农业工人减少的后果包括：耕种的土地面积缩小、转种需要较少劳动力的作物、作物产量下降和农忙时劳力短缺。该流行病还导致损失耕种方法知识，并使有技能和有经验的劳动力减少。在津巴布韦进行的一项调查发现，受艾滋病影响的家庭中，农业产量减少近一半。另一项研究着重肯尼亚的商业农业部门；研究结果显示，与艾滋病有关的发病率和死亡率已经带来沉重的财政、经济和社会负担。

艾滋病毒/艾滋病对保健系统的影响

在许多影响严重的国家，保健系统在遭受艾滋病毒/艾滋病袭击之前就已经很不健全。艾滋病毒/艾滋病流行病给这些系统造成巨大的额外负担，使保健开支和医疗保险制度难以为继。与此同时，保健工作者也在生病和死亡。因此，现有的保健服务供应正在减少而需求则在增加。

治疗艾滋病和机遇性感染（这在艾滋病/艾滋病使免疫系统受到损害的人中十分常见）的开支持续增长。将稀少的资源用于治疗艾滋病毒/艾滋病意味着其他保健事项得到的关注减少。随着政府在艾滋病流行病面前越来越难以通过公共部门提供保健服务，保健费用就必须越来越多地由私营部门、家庭和个人承担。

艾滋病毒/艾滋病对教育的影响

艾滋病毒/艾滋病正在消除迄今在普及初等教育方面取得的成果。艾滋病削弱教育制度，影响孩子上学。长此下去，艾滋病流行病可能造成教育水平和质量下降，减少人力资本，延迟社会和经济发展。

研究发现，教师和学校行政人员中感染艾滋病毒的比率很高，影响教育资源的数量和质量。训练有素和经验丰富的教师很难替代。联合国儿童基金会(儿童基金会)的一项研究估计，1998 年津巴布韦教师的死亡人数相当于损失每年新培训教师的三分之二左右。于是，经验不那么丰富的教师必须替代有经验的教师，造成教育质量的下降。教师缺课扰乱学生的学习进程，也使质量受到影响。

同时，研究表明，如果家庭中有人患病，儿童不太可能仍然上学。那些儿童需要留在家里帮助家务或干活。不太富裕的家庭交不起学费。在乌干达的一个受影响严重的地区所进行的研究发现，三所小学的总入学率从 1989 年到 1993 年下降了 60%。与其他儿童相比，失去双亲的孤儿能够上学的可能性要低得多。在乌干达坎帕拉所作的一项家庭调查指出，在 1990 年，47%的有孤儿的住户无钱送孩子上学，而其他住户则为 10%。

艾滋病毒/艾滋病对经济增长的影响

艾滋病毒/艾滋病流行病给国家的经济造成负担。这在经济较弱的国家（通常是艾滋病毒普遍流行的国家）尤其如此。目前已在受严重影响的许多国家中进行研究，为艾滋病毒/艾滋病对经济增长的影响建立模型。在某些情况下，艾滋病毒/艾滋病对经济的影响估计“不大”。在另一些情况下，则发现国内生产总值较之假设的“没有艾滋病”的情况，每年将下降 2 至 4 个百分点。除了影响国内生产总值之外，艾滋病毒/艾滋病流行病还可能加剧收入的不平等，加深贫困。

艾滋病毒/艾滋病对安康和发展的较长期影响当然比经济分析所表明的更严重。关于艾滋病对经济业绩的影响的估计通常未曾考虑“社会资本”

的损失或对人力资本长期累积的损害，因为儿童教育、营养和健康都受到艾滋病毒/艾滋病的直接和间接影响。对年青一代人力资本的投资减少所造成的后果将影响今后几十年的经济业绩，远远超过大多数经济分析的时限。

结论

2001 年 6 月 25 日至 27 日在纽约举行的大会第二十六届特别会议在第 26-S/2 号决议（附件）中通过《关于艾滋病毒/艾滋病问题的承诺宣言》。《宣言》指出，“艾滋病毒的/艾滋病蔓延全球，其范围极广，影响极深，造成全球紧急状况，是对人的生命和尊严以及切实享受人权的一个最严重的挑战，破坏世界各地的社会和经济发展，影响到社会各个层次——国家、社会、家庭和个人”。

自从《承诺宣言》通过以来，艾滋病毒/艾滋病已变得更严重、更普遍。秘书长向大会第五十八届会议提出的关于执行《关于艾滋病毒/艾滋病问题的承诺宣言》的进展情况报告强调，必须有强有力的政治领导并采取有效的行动，才能防止艾滋病毒/艾滋病大规模蔓延。报告建议所有会员国都制定和执行国家战略，推动向艾滋病毒/艾滋病感染者或受其影响的人提供全面的预防、治疗、护理和支助。

为了战胜艾滋病毒/艾滋病，还需要更多的努力和资源。正如秘书长在报告中推断的，“为资助全球行动，每年为各项艾滋病毒/艾滋病方案提供的资金，到 2005 年必须是现在的三倍，到 2007 年则应为五倍”。

艾滋病毒/艾滋病的发展路程不是事先定好的。此病最终的发展情形取决于个人、社区、国家和世界如何应付目前和今后的艾滋病毒/艾滋病威胁。

EXECUTIVE SUMMARY

HIV/AIDS is the deadliest epidemic of our time. Over 22 million people have already lost their lives, and more than 42 million are currently living with HIV/AIDS. Even if a vaccine for HIV were discovered today, over 40 million people would still die prematurely as a result of AIDS. In many countries, especially in Africa and the hardest-hit countries such as Botswana, Swaziland and Zimbabwe, the AIDS epidemic has spread rapidly, leaving illness, death, poverty and misery in its wake. In other countries the disease is still in its early stages. Notably, HIV/AIDS has now taken hold in the most populous countries of the world—the number of people infected with HIV has reached one million in China and six million in India; the destructive effects of the epidemic are already beginning to be felt in those countries.

The epidemic has not only killed people; it has imposed a heavy burden on families, communities and economies. The misery and devastation already caused by HIV/AIDS is enormous, but it is likely that the future impact will be even greater, as the list of significantly affected countries continues to grow. It is difficult to predict with certainty the future course of the epidemic. Much depends on:

- Educating people about the dangers of the virus and persuading them to change their behaviour
- Finding effective ways to prevent the virus from spreading further
- Discovering new medicines and treatments
- Mobilizing the financial and human resources necessary for accomplishing these tasks

Soon after the onset of the epidemic, the Department of Economic and Social Affairs' Population Division began to study the demography of HIV/AIDS and incorporated the impact of HIV/AIDS into the biennial revisions of the official United Nations world population estimates and projections[1]. The present report goes further, to consider the broader impacts of HIV/AIDS on development. The report provides input for the thirty-eighth session of the Commission on Population and Development, meeting in 2005, whose theme will be "Population, development and HIV/AIDS, with special emphasis on poverty". It also provides an overview of the full spectrum of consequences of the AIDS epidemic for the General Assembly's review in 2005 of the implementation of the United Nations Declaration of Commitment on HIV/AIDS, which was adopted in 2001 (A/RES/S-26/2).

[1] *World Population Prospects: The 2002 Revision* (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.6).

In addition to analysing the demographic impact of HIV/AIDS, *The Impact of AIDS* highlights the impact of HIV/AIDS on families and households, and on agricultural sustainability, business, the health sector, education and national economic growth. The HIV/AIDS epidemic has erased decades of progress in combating mortality and has seriously compromised the living conditions of current and future generations. The disease has such a staggering impact because it weakens and kills many people in their young adulthood, the most productive years for income generation and family caregiving. It destroys families, eliminating a whole generation crucial for the survival of the younger and older persons in society.

The demographic impact of HIV/AIDS

HIV/AIDS has already had a devastating demographic impact, especially in sub-Saharan Africa. The epidemic has resulted in terrible losses of life and population. Recent United Nations population projections show even more drastic losses over the coming decades.

World Population Prospects: The 2002 Revision, the United Nations official world population estimates and projections, incorporated the effects of HIV/AIDS for the 53 hardest-hit countries. Those 53 countries are home to over 90 per cent of the adults living with HIV. The annual number of excess deaths in the 53 countries had reached one million by the early 1990s, 3 million by 2000 and over 4 million by 2003.

Thirty-eight of the 53 countries—three out of every four—are located in sub-Saharan Africa. About 100 million additional deaths are expected in those African countries by 2025 as a result of the HIV epidemic. By 2025, those countries will have 14 per cent fewer inhabitants than they would have had in the absence of AIDS.

Although the demographic effects of HIV/AIDS in countries outside Africa are relatively moderate and prevalence rates are lower, the human losses are still enormous. Prior to 2025, AIDS is expected to cause 31 million additional deaths in India and 18 million more deaths in China.

Mortality has surged in countries with high HIV prevalence rates, rising within a decade to levels not seen since the 1950s or 1960s. In the 38 most affected African countries, nearly ten years of life expectancy will have been lost by 2020-2025, and in the seven highest-prevalence countries, nearly 30 years will have been lost. Outside Africa, countries projected to experience a significant reduction of life expectancy include the Bahamas, Cambodia, the Dominican Republic, Haiti and Myanmar.

Botswana currently has the highest HIV prevalence rate in the world: more than one in every three adults is HIV-positive. Life expectancy had reached 65 years in 1990-1995, but it dropped to 56 years by 1995-2000 and is currently around 40 years as a result of deaths related to AIDS. The population

will likely begin to decline within a few years. Although the full economic impact of HIV/AIDS is still to come, population projections for Botswana show a severe deficit of working-age people by 2025.

The impact of HIV/AIDS on households and families

Households feel the immediate impact of the HIV/AIDS epidemic. Indeed, households and families bear most of the burden since they are the primary units for coping with the disease and its consequences. Families in which the infected person is the breadwinner suffer financially, both from the loss of earnings and the increased expenditure for medical care. During the long period of illness, the loss of income and the cost of caring for a family member impoverish households. Studies document reduced levels of household consumption, including a reduction in food consumption, resulting in malnutrition. The HIV/AIDS epidemic poses additional challenges in places where the disease carries a heavy social stigma.

As HIV infection is most common among young adults, a significant part of the generation of young parents is lost, and family composition undergoes rapid changes. Severely affected countries show increases in the percentage of female-headed households and grandparent-headed households, as well as households headed by young orphans. When a family member dies, the household may be dissolved altogether, and the children may be sent to live with relatives or even left on their own.

The death of a spouse has an especially severe impact in societies with a marked gender division of labour since the surviving spouse cannot take on the work or responsibilities of the ill or deceased family member. In the Rakai district of Uganda, for example, AIDS deaths caused labour shortages for both farm and domestic work.

By 2001, 14 million children under age 15 had already lost one or both parents to HIV/AIDS. Eleven million of those children live in sub-Saharan Africa. The numbers will probably double by 2010. It is common for relatives to take orphans into their own homes, especially in African societies, but the rapid rise in the number of orphans would overwhelm the traditional support system of the extended family. Many of the households fostering orphans are themselves poor, and taking in orphaned children represents a significant burden.

The impact of HIV/AIDS on firms

The disease affects business enterprises in both the agricultural and non-agricultural sectors. Available studies on the impact of HIV/AIDS point to impacts on the size and quality of the labour force and on labour costs, as the most productive workers become too ill to work effectively, or to work at all, and eventually die. The loss of workers from AIDS and the cost of providing health care benefits and death benefits have had serious effects on employers.

The impact on firms depends primarily on five factors: the number of employees infected; their role in the company; the structure of the production process and its ability to cope with the loss of employees; the health-care benefits provided by the company; and the effect of HIV/AIDS on the business environment. During the early stages of the disease, workers can often continue to work but take more sick days and leave time. Companies that provide health-care benefits for workers and their families may not be able to meet the costs of health care and the expensive drugs used to treat HIV/AIDS. A study in Malawi found, for instance, that worker deaths in one company increased more than 40 per cent over a five-year period, resulting in the payment of substantially higher death benefits.

Young adults in their prime working years are most likely to contract HIV, and younger workers are disproportionately more likely to die of AIDS. Depending on the positions held by infected workers, production and management suffer. Workers with exceptional skills and longer experience are hardest to replace. At the same time, demand for goods and services may decline since afflicted households have less income and lower consumption levels.

The impact of HIV/AIDS on agriculture

HIV/AIDS is having a crushing effect on agricultural production and the economic viability of small farms and commercial agricultural enterprises. The Food and Agriculture Organization of the United Nations (FAO) has found that in the 10 African countries most severely affected by HIV/AIDS, the agricultural labour force will decline between 10 and 26 per cent by 2020. Botswana, Mozambique, Namibia and Zimbabwe are each expected to lose at least one fifth of their agricultural workers.

Among the consequences of the loss of farm workers are the reduction in land under cultivation, the shift to crops that require less labour, a decline in crop yields and a shortage of labour during periods of high labour demand. The epidemic also leads to a loss of knowledge about farming methods and a reduction in skilled and experienced labour. A survey in Zimbabwe found that agricultural output declined by nearly 50 per cent among households affected by AIDS. Another study focused on the commercial agricultural sector of Kenya; it reported that AIDS-related morbidity and mortality had already imposed profound financial, economic and social costs.

The impact of HIV/AIDS on health systems

Health-care systems were already inadequate in many of the highly impacted countries even before HIV/AIDS struck. The HIV/AIDS epidemic has made enormous additional demands on those systems, straining health budgets and health insurance schemes. At the same time, health-care workers are also falling ill and dying. Thus, the supply of available health services is being depleted while the demand is increasing.

Expenditures have been rising for the treatment of AIDS and the opportunistic infections that are common in persons whose immune systems have been compromised by HIV/AIDS. The allocation of scarce resources for treating HIV/AIDS has meant that other health concerns receive less attention. As Governments become increasingly hard-pressed in the face of the AIDS epidemic to provide health care through the public sector, health care costs must increasingly be borne by the private sector and by households and individuals.

The impact of HIV/AIDS on education

HIV/AIDS is eroding the gains that have been made towards achieving universal primary education. AIDS weakens educational systems and hampers children's school attendance. In the long run, the AIDS epidemic may lead to a decline in the level and quality of education, diminishing human capital and delaying social and economic development.

Studies have found a high rate of HIV infection among teachers and school administrators, affecting both the amount and quality of educational resources. Trained, experienced teachers are difficult to replace. A study by the United Nations Children's Fund (UNICEF) estimated that the number of teachers' deaths in Zambia in 1998 was equivalent to the loss of about two thirds of the annual output of newly trained teachers. Experienced teachers are, by necessity, replaced by less experienced teachers; the quality of education consequently declines. Quality is also compromised when the absenteeism of teachers disrupts the learning process of their students.

At the same time, studies show that children in families with an infected member are less likely to remain in school. Those children are needed at home to help in the house or to work. Less affluent families are unable to afford school fees. A study in a highly infected district of Uganda found that total enrolments in three primary schools experienced a 60 per cent drop from 1989 to 1993. Orphans who have lost both parents are also much less likely than other children to be in school. A household survey in Kampala, Uganda, reported that in 1990, 47 per cent of households with orphans did not have enough money to send their children to school, as compared with 10 per cent of other households.

The impact of HIV/AIDS on economic growth

The HIV/AIDS epidemic burdens the economy of any country. This is especially true for the weak economies that are generally characteristic of countries with high levels of HIV prevalence. In many of the highly affected countries, studies have been undertaken to model the impact of HIV/AIDS on economic growth. In some cases, estimates of the economic impact of HIV/AIDS have been "small". In other cases, annual reductions of from 2 to 4 percentage points of gross domestic product per year have been found, compared to a hypothetical "no-AIDS" situation. Beyond its effects on gross

domestic product, the HIV/AIDS epidemic is likely to exacerbate income inequality and increase poverty.

The longer-term impact of HIV/AIDS on welfare and development is certainly more serious than the economic analyses suggest. Estimates of AIDS' impacts on economic performance usually do not take into account the loss of "social capital" or of the long-term damage accruing to human capital, as children's education, nutrition and health suffer directly and indirectly as a consequence of HIV/AIDS. The effects of lowered investment in the human capital of the younger generation will affect economic performance for decades to come, well beyond the time frame of most economic analyses.

Conclusions

By its resolution 26-S/2 (annex), the General Assembly, at its twenty-sixth special session, held in New York from 25 to 27 June 2001, adopted the Declaration of Commitment on HIV/AIDS. The Declaration states that "the global HIV/AIDS epidemic, through its devastating scale and impact, constitutes a global emergency and one of the most formidable challenges to human life and dignity, as well as to the effective enjoyment of human rights, which undermines social and economic development throughout the world and affects all levels of society—national, community, family and individual".

Since the adoption of the Declaration of Commitment, the HIV/AIDS epidemic has worsened and become more widespread. The report of the Secretary-General to the fifty-eighth session of the General Assembly on progress towards implementation of the Declaration of Commitment on HIV/AIDS emphasizes that assertive political leadership and effective action are required to prevent a major expansion of HIV/AIDS. The report recommends that all countries develop and implement national strategies to promote the delivery of comprehensive prevention, treatment, care and support to those people living with or affected by HIV/AIDS.

In order to conquer HIV/AIDS, considerably greater efforts and resources will be required. As the Secretary-General concluded in his report, "to finance the global response, …annual funding for HIV/AIDS programmes must increase threefold over current levels by 2005, and fivefold by 2007".

The course of the HIV/AIDS epidemic is by no means predetermined. The eventual course of the disease depends on how individuals, communities, nations and the world respond to the HIV/AIDS threat today and tomorrow.

RÉSUMÉ

L'épidémie de VIH/sida est la plus mortelle qu'il soit à notre époque. Elle a déjà coûté la vie à plus de 22 millions de personnes et plus de 42 millions d'autres vivent actuellement avec la maladie. Même si l'on découvrait aujourd'hui un vaccin contre le VIH, plus de 40 millions de personnes mourraient encore prématurément. Dans bien des pays, particulièrement en Afrique dans ceux où elle fait le plus de ravages comme le Botswana, le Swaziland et le Zimbabwe, l'épidémie s'est propagée rapidement, laissant dans son sillage la maladie, la mort, la pauvreté et la misère. Dans d'autres, elle en est encore à ses débuts. Il est à noter que le VIH/sida touche maintenant les pays les plus peuplés du monde : la Chine compte 1 million de séropositifs et l'Inde 6 millions et l'une comme l'autre commencent à ressentir les effets destructeurs de l'épidémie.

Non seulement l'épidémie tue mais elle met lourdement à contribution les familles, les collectivités locales et les économies. La misère et la dévastation qu'elle a déjà entraînées sont incommensurables mais il est probable que ses effets deviendront encore plus dévastateurs à mesure que s'allongera la liste des pays gravement touchés. Il est difficile de prévoir avec certitude comment elle évoluera. Cela dépendra en grande partie des mesures qui auront été prises en vue de :

- Sensibiliser les gens aux dangers du virus et les persuader de changer de comportement;
- Trouver des moyens efficaces d'empêcher le virus de se propager davantage;
- Découvrir de nouveaux médicaments et traitements;
- Mobiliser les ressources financières et humaines nécessaires pour accomplir ses tâches.

Peu après le début de l'épidémie, la Division de la population du Département des affaires économiques et sociales a entrepris d'étudier la démographie du VIH/sida et elle a pris en compte ses répercussions dans les révisions biennales des estimations et projections démographiques mondiales officielles de l'ONU[1]. Le présent rapport va plus loin, il examine les effets plus larges du VIH/sida sur le développement. Il vise à éclairer les débats de la Commission de la population et du développement à sa trente-huitième session, en 2005, dont le thème sera : " Population, développement et VIH/sida, et leur rapport avec la pauvreté ". Il présente par ailleurs un tour d'horizon de l'ensemble des conséquences de l'épidémie du sida auquel l'Assemblée générale pourra se référer en 2005 lorsqu'elle examinera la mise en œuvre de la Déclaration d'engagement sur le VIH/sida qu'elle a adoptée en 2001 (A/RES/S-26/2).

On trouvera dans les *Répercussions du VIH/sida* non seulement une analyse des conséquences démographiques de l'épidémie, mais aussi un bref tour d'horizon de ses effets sur les familles et les ménages ainsi que sur l'agriculture durable, le secteur privé, les services de santé, l'éducation et la croissance économique nationale. L'épidémie a fait perdre le terrain gagné au

[1] *World Population Prospects: The 2002 Revision* (publication des Nations Unies, Division de la population du Département des affaires économiques et sociales, n° de vente : E.03.XIII.6).

prix de dizaines d'années d'efforts en matière de mortalité et elle met sérieusement en péril les conditions de vie des générations actuelles et à venir. Si ses répercussions sont aussi énormes, c'est parce qu'elle affaiblit et tue nombre de jeunes adultes qu'elle fauche au cours des années les plus productives de leur existence du point de vue de la génération de revenus et des soins à la famille. Elle détruit la famille en éliminant une génération entière qui a un rôle essentiel à jouer dans la survie des plus jeunes et des plus âgés.

Les répercussions démographiques du VIH/sida

Les répercussions démographiques du VIH/sida sont déjà colossales, en particulier en Afrique subsaharienne. L'épidémie a entraîné de terribles pertes en vies humaines. Selon les dernières projections démographiques de l'ONU, les ravages pourraient être encore plus catastrophiques dans les décennies à venir.

La publication intitulée *Word Population Prospects: The 2002 Revision*, qui renferme les estimations et projections démographiques mondiales officielles de l'ONU, présente les effets du VIH/sida dans les 53 pays les plus atteints, où vivent plus de 90 % des adultes séropositifs. La surmortalité imputable à la maladie a été de 1 million de décès au début des années 90, de 3 millions en 2000 et de plus de 4 millions en 2003.

Trente-huit de ces 53 pays – soit trois sur quatre – se trouvent en Afrique subsaharienne. Dans ces pays, la surmortalité imputable à l'épidémie devrait dépasser 100 millions de décès en 2005. À cette date, ces pays compteront 14 % d'habitants de moins qu'ils n'en auraient eu sans le sida.

Bien que, dans les pays situés ailleurs qu'en Afrique, les retombées démographiques du VIH/sida soient relativement modérées et la prévalence moins forte, les pertes en vies humaines demeurent colossales. On s'attend à ce que d'ici à 2025, la surmortalité imputable au sida atteigne 31 millions de décès en Inde et 18 millions de décès en Chine.

Depuis 10 ans, le taux de mortalité a augmenté en flèche dans les pays où la prévalence du VIH est forte pour atteindre des niveaux jamais vus depuis les années 50 ou 60. Dans les 38 pays africains les plus touchés, l'espérance de vie diminuera de 10 ans ou presque d'ici à 2020-2025 et dans les sept pays où le taux de prévalence est le plus élevé, de près de 30 ans. En dehors de l'Afrique, on s'attend à ce qu'elle diminue de manière significative dans les pays comme les Bahamas, le Cambodge, Haïti, le Myanmar et la République dominicaine.

C'est au Botswana que l'on observe actuellement le taux de prévalence du VIH le plus élevé du monde : plus d'un tiers de la population adulte y est séropositive. L'espérance de vie, qui était de 65 ans entre 1990 et 1995, est passé à 56 ans entre 1995 et 2000 et se situe actuellement autour de 40 ans à cause du sida. Il est vraisemblable que la population commencera à diminuer d'ici quelques années. Bien que toutes les répercussions du VIH/sida sur l'économie ne se soient pas encore fait sentir, les projections démographiques pour le Botswana indiquent qu'en 2025, le pays devrait connaître un grave déficit en population active.

Les répercussions du VIH/sida sur les ménages et les familles

Les ménages se ressentent immédiatement des effets de l'épidémie de VIH/sida. De fait, les ménages et les familles sont les plus lourdement mis à contribution puisque ce sont eux qui, les premiers, ont à faire face à la maladie et à ses conséquences. Les familles dont le membre séropositif est le soutien financier se trouvent aux prises non seulement avec la perte de leur revenu mais avec l'augmentation de leurs frais médicaux. La perte de revenus et le coût du traitement de cette longue maladie font sombrer les ménages dans la pauvreté. Des études ont montré que leur consommation chutait et qu'il y avait notamment réduction des dépenses d'alimentation et, par suite, malnutrition. L'épidémie est source d'autres problèmes encore dans les endroits où la société attribue à la maladie un caractère honteux.

Comme l'infection au VIH est particulièrement fréquente parmi les jeunes adultes, elle anéantit des pans entiers d'une même génération de jeunes parents et la composition de la famille s'en trouve rapidement modifiée. Dans les pays gravement touchés, on observe une augmentation de la proportion de familles dont le chef est une femme, un grand-parent ou bien encore un jeune orphelin. Il arrive que le décès d'un membre de la famille entraîne la dissolution complète du ménage et que les enfants soient envoyés chez des proches ou demeurent entièrement livrés à eux-mêmes. Le décès d'un conjoint a des conséquences particulièrement dramatiques dans les sociétés où les tâches sont réparties de façon rigide entre les deux sexes, dans la mesure où le conjoint survivant ne peut pas assumer les tâches ou les responsabilités du membre de la famille malade ou défunt. Dans le district de Rakai en Ouganda, les décès imputables au sida ont ainsi entraîné une pénurie de main-d'œuvre agricole et domestique.

Dès 2001, on dénombrait 15 millions d'enfants de moins de 15 ans orphelins de père ou de mère ou des deux parents, dont 11 millions en Afrique subsaharienne. Ce chiffre doublera vraisemblablement d'ici à 2010. Il est fréquent que des orphelins soient recueillis par des proches, en particulier dans les sociétés africaines, mais la multiplication rapide du nombre des orphelins submergerait le système d'appui traditionnel de la famille élargie. Bien des ménages qui recueillent des orphelins sont eux-mêmes pauvres et l'accueil de ces enfants représente pour eux un fardeau considérable.

Les répercussions du VIH/sida sur les entreprises

La maladie a des répercussions sur le secteur privé, et dans l'agriculture comme dans d'autres branches d'activité. Des études ont montré qu'elle avait des effets préjudiciables sur le volume et la qualité de la main-d'œuvre et sur les coûts salariaux, dans la mesure où les travailleurs les plus productifs deviennent trop malades pour travailler efficacement, ou même pour travailler tout court, et finissent par mourir. La perte de ces travailleurs et les frais associés à l'assurance maladie et au capital-décès pèsent lourdement sur les entreprises.

L'impact de l'épidémie sur l'entreprise est essentiellement fonction de cinq facteurs : le nombre d'employés contaminés; le poste qu'ils occupent; la structure du processus de production et sa capacité à absorber la perte de main-d'œuvre; l'assurance maladie offerte par l'entreprise; l'effet du VIH/sida sur le marché. Aux premiers stades de la maladie, les travailleurs continuent souvent à s'acquitter de leurs tâches, mais ils prennent davantage de jours de congé maladie et de vacances. Les entreprises qui offrent une assurance

maladie aux travailleurs et à leur famille n'ont pas nécessairement les moyens de faire face au coût élevé du traitement et des médicaments. Une étude réalisée au Malawi a cité le cas d'une entreprise où le nombre de décès avait augmenté de plus de 40 % en cinq ans, ce qui avait considérablement accru le montant des sommes qu'elle avait dû débourser au titre du capital-décès.

Les jeunes adultes qui viennent d'entrer dans la vie active sont les plus exposés et on observe un nombre disproportionné de décès dans ce groupe d'âge. Suivant la place qu'ils occupaient dans l'entreprise, la production ou la gestion s'en trouvent compromises. Ceux qui avaient des compétences exceptionnelles et davantage d'expérience sont les plus difficiles à remplacer. Parallèlement, la demande de biens et de services peut diminuer puisque les ménages touchés ont des revenus moindres et réduisent leur consommation.

Les répercussions du VIH/sida sur l'agriculture

Le VIH/sida a un impact dévastateur sur la production agricole et la viabilité économique des petites fermes et des entreprises agricoles commerciales. Selon les prévisions de l'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO), les effectifs de la main-d'œuvre agricole diminueront de 10 à 26 % d'ici à 2020 dans les 10 pays africains les plus gravement touchés par le VIH/sida. On s'attend à ce que le Botswana, le Mozambique, la Namibie et le Zimbabwe perdent chacun au moins un cinquième de leur main-d'œuvre agricole.

La perte de travailleurs agricoles entraîne la diminution de la superficie des terres cultivées, le choix de cultures à moindre coefficient de main-d'œuvre, une baisse du rendement et une pénurie de main-d'œuvre pendant les périodes de pointe. L'épidémie a également eu pour conséquence une perte des savoir-faire et une diminution des effectifs de la main-d'œuvre qualifiée et expérimentée. Une enquête menée au Zimbabwe a montré que la production agricole avait baissé de près de 50 % dans les ménages touchés par le sida. Une autre étude, consacrée au secteur agricole commercial du Kenya, a révélé que la morbidité et la mortalité liées au sida avaient déjà entraîné des coûts financiers, économiques et sociaux extrêmement lourds.

Les répercussions du VIH/sida sur les services de santé

Avant même l'apparition de l'épidémie, les services de santé étaient déjà inadéquats dans nombre des pays fortement touchés. Depuis, ils ont été très fortement sollicités, ce qui a eu pour effet de grever lourdement les budgets et les systèmes d'assurance maladie. Ainsi, l'offre va s'amenuisant alors que la demande augmente.

Les dépenses associées au traitement du sida et des infections opportunistes chez les personnes dont le système immunitaire a été fragilisé par le virus sont de plus en plus élevées. Elles ont entraîné des ponctions dans des budgets déjà limités, au détriment d'autres préoccupations sanitaires. Les pouvoirs publics ayant de plus en plus de difficultés à dispenser les soins nécessaires par l'intermédiaire du secteur public, les coûts sont de plus en plus souvent à la charge du secteur privé, des ménages et des particuliers.

Les répercussions du VIH/sida sur l'éducation

Le VIH/sida érode les progrès qui avaient été faits sur la voie de l'universalité de l'éducation primaire. Il affaiblit les systèmes éducatifs et compromet la fréquentation scolaire. À long terme, il pourrait entraîner une

diminution du niveau et de la qualité de l'enseignement, ce qui affaiblirait le capital humain et ralentirait et le développement économique et social.

Il ressort de certaines études que le taux d'infection au VIH est élevé parmi les enseignants et les administrateurs d'école, ce qui retentit à la fois sur la quantité et la qualité des ressources disponibles en matière d'éducation. Il est difficile de remplacer les enseignants qualifiés et expérimentés. Selon une étude du Fonds des Nations Unies pour l'enfance (UNICEF), le sida a fait tellement de victimes parmi les enseignants en Zambie en 1998, que cette perte a été l'équivalent, pour le pays, de ce qu'aurait été la disparition des deux tiers ou presque des nouveaux enseignants formés au cours de l'année. Les enseignants expérimentés sont inévitablement remplacés par du personnel plus nouveau et la qualité de l'enseignement s'en ressent. Le niveau est également compromis lorsque l'absentéisme des enseignants perturbe l'assimilation des connaissances par les élèves.

Parallèlement, certaines études montrent que les enfants appartenant à une famille touchée risquent davantage de cesser de fréquenter l'école, soit parce qu'on a besoin d'eux à la maison, soit parce qu'ils doivent travailler. Les familles moins aisées ne peuvent plus payer les frais de scolarité. Une étude réalisée dans un district particulièrement frappé en Ouganda a montré que, dans trois écoles primaires, le nombre d'enfants inscrits avait diminué au total de 60 % entre 1989 et 1993. Le taux de scolarisation est particulièrement faible parmi les orphelins qui ont perdu leurs deux parents. Une enquête réalisée auprès des ménages à Kampala, en Ouganda, a montré qu'en 1990, 47 % des ménages comptant des orphelins n'avaient pas les moyens d'envoyer leurs enfants à l'école, alors que seuls 10 % des autres ménages se trouvaient dans cette situation.

Les répercussions du VIH/sida sur la croissance économique

L'épidémie de VIH/sida représente une lourde charge pour toute économie et, à plus forte raison, pour les économies fragiles qui caractérisent en général les pays où le taux de prévalence du VIH est élevé. On a entrepris des études dans nombre de pays gravement touchés pour préserver sous forme de modèle les répercussions du VIH/sida sur la croissance économique. Dans certains cas, on a estimé que les retombées seraient « peu importantes ». Dans d'autres, on a déterminé que le produit intérieur brut annuel serait inférieur dans une proportion allant de 2 à 4 % à ce qu'il aurait été si l'épidémie n'était pas survenue. En dehors de ses effets sur le produit intérieur brut, l'épidémie de VIH/sida risque d'exacerber l'inégalité des revenus et d'augmenter la pauvreté.

Les répercussions à plus long terme du VIH/sida sur le bien-être et le développement sont certainement plus graves que ne le laissent entendre les analyses économiques. Les évaluations ne tiennent généralement pas compte des pertes en " capital social " ou de l'effet cumulatif préjudiciables sur le capital humain des carences éducatives et des problèmes de nutrition et de santé soulevés directement ou indirectement par l'épidémie. Les conséquences de la diminution des investissements en capital humain pour la jeune génération auront des effets sur les résultats économiques pendant des décennies, bien au-delà de la période couverte par la plupart des analyses économiques.

Conclusions

Par sa résolution 26-S/2 (annexe), l'Assemblée générale, à sa vingt-sixième session extraordinaire, tenue à New York du 25 au 27 juin 2001, a adopté la Déclaration d'engagement sur le VIH/sida. Dans cette déclaration, elle dit que "l'épidémie mondiale de VIH/sida, en raison de son ampleur et de son incidence dévastatrices, constitue une crise mondiale et l'un des défis les plus redoutables pour la vie et la dignité humaines ainsi que pour l'exercice effectif des droits de l'homme, compromet le développement social et économique dans le monde entier et affecte la société à tous les niveaux – national, local, familial et individuel ".

Depuis l'adoption de la Déclaration d'engagement, l'épidémie de VIH/sida s'est aggravée et propagée. Dans le rapport qu'il a présenté à l'Assemblée générale à sa cinquante-huitième session sur les progrès qui avaient été faits dans la mise en œuvre de la Déclaration d'engagement sur le VIH/sida, le Secrétaire général souligne qu'il faut une direction politique énergique et des mesures effectives pour prévenir une expansion majeure du VIH/sida. Il recommande à tous les pays de mettre au point et d'exécuter des stratégies nationales destinées à promouvoir la prévention, le traitement, les soins et le soutien psychologique parmi les personnes infectées ou affectées par le VIH sida.

Si l'on veut juguler l'épidémie, il faudra consentir des efforts beaucoup plus importants, notamment sur le plan financier. Comme conclut le Secrétaire général dans son rapport, "pour financer les mesures à prendre à l'échelle mondiale ... les ressources financières annuelles consacrées aux programmes de lutte contre le VIH/sida doivent tripler par rapport au niveau actuel d'ici à 2005 et quintupler d'ici à 2007 ".

L'évolution de l'épidémie de VIH/sida n'est en aucune manière prédéterminée. Elle dépendra de la façon dont les particuliers, les collectivités, les nations et le monde entier réagiront à la menace, dans l'immédiat et à l'avenir.

Резюме

ВИЧ/СПИД — самая смертоносная эпидемия нашего времени. Свыше 22 млн. человек уже умерло, и более 42 млн. инфицировано ВИЧ/СПИД. Даже если сегодня будет найдена вакцина против ВИЧ-инфекции, от СПИДа преждевременной смертью все равно умрет свыше 40 млн. человек. Во многих странах, особенно в Африке, и в первую очередь в странах, наиболее серьезно затронутых этой проблемой, таких как Ботсвана, Зимбабве и Свазиленд, быстро распространяющаяся эпидемия СПИДа сеет болезни, смерть, нищету и страдания. В других странах это заболевание пока находится на ранних стадиях распространения. Однако в последнее время ВИЧ/СПИД начала «захватывать» наиболее густонаселенные страны мира: число ВИЧ-инфицированных в Китае достигло 1 млн. человек, а в Индии — 6 млн.; эти страны уже начинают ощущать всю разрушительную силу эпидемии.

Эпидемия ВИЧ/СПИД не только убивает людей; она оказывает пагубное воздействие на семьи, общины и экономику стран. Эпидемия уже принесла огромные страдания и разорение, однако в будущем ее оздействие может оказаться еще более масштабным, поскольку список серьезно затронутых этой проблемой стран продолжает расти. Сегодня сложно с уверенностью предсказать дальнейшее развитие эпидемии. Многое зависит от того, удастся ли:

- донести до сознания людей всю опасность этого вируса и убедить их изменить свое поведение;
- изыскать эффективные пути предотвращения дальнейшего распространения вируса;
- создать новые лекарства и разработать новые методы лечения;
- мобилизовать необходимые финансовые и людские ресурсы для выполнения этих задач.

Вскоре после возникновения эпидемии Отдел народонаселения Департамента по экономическим и социальным вопросам начал изучать демографию ВИЧ/СПИД и включать информацию о его воздействии в двухгодичные обзоры Организации Объединенных Наций, содержащие официальные оценки и прогнозы демографического положения в мире[1]. Настоящий доклад идет еще дальше: в нем рассматриваются более общие аспекты воздействия ВИЧ/СПИД на процесс развития. Он подготовлен к тридцать восьмой сессии Комиссии по народонаселению и развитию, которая состоится в 2005 году и будет посвящена теме «Народонаселение, развитие и ВИЧ/СПИД с уделением особого внимания проблеме нищеты». В нем также дается общий анализ всего спектра последствий эпидемии СПИДа, что призвано послужить вкладом в проведение Генеральной Ассамблеей в 2005 году обзора хода осуществления Декларации Организации Объединенных Наций о приверженности делу борьбы с ВИЧ/СПИД, которая была принята в 2001 году (A/RES/S-26/2).

[1] “World Populations Prospects: The 2002 Revision” («Мировые демографические перспективы: Обзор 2002 года» (издание Отдела народонаселения Департамента Организации Объединенных Наций по экономическим и социальным вопросам, в продаже под № E.03.XIII.6).

Помимо анализа воздействия ВИЧ/СПИД на народонаселение, в публикации “The Impact of AIDS” («Воздействие СПИДа») рассматривается воздействие ВИЧ/СПИД на семьи и домашние хозяйства, а также на устойчивость сельскохозяйственного производства, предпринимательскую деятельность, сектор здравоохранения, образование и экономический рост стран. Эпидемия ВИЧ/СПИД свела на нет десятилетия прогресса в области борьбы со смертностью и подвергла серьезному риску условия жизни нынешнего и будущих поколений. Столь ужасающие последствия этого заболевания объясняются тем, что оно подрывает здоровье и убивает множество людей в молодом и самом продуктивном возрасте, когда они могут получать наибольший доход и растить детей. Оно разрушает семьи, уничтожая целое поколение, без которого в обществе не могут выжить ни малолетние, ни престарелые.

Демографические последствиа ВИЧ/СПИД

ВИЧ/СПИД уже привел к опустошительным демографическим последствиям, особенно в районе Африки к югу от Сахары. Эпидемия стала причиной гибели огромного числа людей и сокращения численности населения. По последним демографическим прогнозам Организации Объединенных Наций, еще большее число людей погибнет в ближайшие десятилетия.

В публикацию Организации Объединенных Наций “World Populations Prospects: The 2002 Revision” («Мировые демографические перспективы: Обзор 2002 года»), содержащую официальные оценки и прогнозы демографического положения в мире, была включена информация о последствиях ВИЧ/СПИД в 53 наиболее затронутых этой проблемой странах. Свыше 90 процентов взрослого населения этих стран инфицировано ВИЧ. В среднем ежегодное число дополнительно умерших в этих 53 странах составляло 1 млн. в начале 90-х годов, 3 млн. — в 2000 году и свыше 4 млн. — в 2003 году.

Тридцать восемь из вышеупомянутых 53 стран, т.е. три четверти, расположены в районе Африки к югу от Сахары. По прогнозам, к 2025 году в результате эпидемии ВИЧ/СПИД в этих африканских странах умрет еще около 100 млн. человек. К 2025 году население этих стран будет на 14 процентов меньше того, каким оно могло бы быть, если бы не существовало СПИДа.

Несмотря на сравнительное умеренное демографическое воздействие ВИЧ/СПИД и меньшие масштабы распространения этого заболевания в неафриканских странах, человеческие жертвы все же огромны. Предполагается, что до 2025 года СПИД станет причиной 31 млн. дополнительных смертей в Индии и 18 млн. дополнительных смертей — в Китае.

В странах с широким распространением ВИЧ-инфекции наблюдается резкое повышение смертности: за десять лет она поднялась до уровней 1950-х и 1960-х годов. В 38 африканских странах, в наибольшей степени затронутых этой проблемой, к 2020–2025 годам продолжительность жизни сократится почти на десять лет, а в семи странах с наибольшим распространением ВИЧ-инфекции — почти на 30 лет. Что касается неафриканских стран, то наиболее существенное сокращение продолжительности жизни прогнозируется на Багамских Островах, в Доминиканской Республике, Гаити, Камбодже и Мьянме.

В настоящее время лидирующее место в мире по масштабам распространения ВИЧ-инфекции занимает Ботсвана: ВИЧ инфицировано более трети взрослого населения. В 1990–1995 годах продолжительность жизни достигала 65 лет, однако к 1995–2000 годам вследствие повышения смертности по причинам, связанным со СПИДом, она упала до 56 лет и в настоящее время составляет примерно 40 лет. В ближайшие несколько лет численность населения, вероятно, начнет сокращаться. Хотя пока экономика Ботсваны и не ощущает на себе мощного воздействия ВИЧ/СПИД, к 2025 году в стране возникнет огромная нехватка людей трудоспособного возраста.

Воздействие ВИЧ/СПИД на домашние хозяйства и семьи

Эпидемия ВИЧ/СПИД оказывает на домашние хозяйства самое непосредственное воздействие. Действительно, домашние хозяйства и семьи сталкиваются с наибольшими проблемами, поскольку в первую очередь именно им приходится заботиться о больных и нести на себе все бремя связанных с этим забот. В семьях с ВИЧ-инфицированным кормильцем возникают финансовые трудности, обусловленные как потерей заработка, так и увеличением расходов на лечение. За долгий период болезни домашние хозяйства, лишенные дохода и вынужденные расходовать скудные средства на уход за больным членом семьи, нищают. По данным исследований, потребление домашних хозяйств падает, в том числе сокращается потребление продуктов питания, что ведет к недоеданию. Эпидемия ВИЧ/СПИД создает дополнительные проблемы в тех местах, где инфицированные подвергаются жесточайшему социальному остракизму.

Поскольку ВИЧ-инфекция больше всего распространена среди молодежи, значительная часть поколения молодых родителей оказывается потерянной и структура семьи претерпевает быстрые изменения. В серьезно затронутых этой проблемой странах наблюдается увеличение доли домашних хозяйств, возглавляемых женщиной, бабкой/дедом или несовершеннолетним ребенком-сиротой. В результате смерти одного из членов семьи домашнее хозяйство вообще может распасться, а дети могут быть переданы на попечение родственникам или даже брошены на произвол судьбы.

Смерть супруга/супруги имеет особенно серьезные последствия для общества с явно выраженным разделением труда по признаку пола, так как выживший супруг/выжившая супруга не может занять рабочее место больного или умершего члена семьи или взять на себя выполнение его обязанностей. Так, в районе Ракай, Уганда, СПИД стал причиной нехватки рабочей силы как в сельском хозяйстве, так и в секторе домашних услуг.

К 2001 году в результате эпидемии ВИЧ/СПИД одного или обоих родителей лишились 14 млн. детей в возрасте до 15 лет. Одиннадцать миллионов из них проживает в странах Африки к югу от Сахары. К 2010 году их число, вероятно, удвоится. Обычно заботу о сиротах берут на себя родственники, особенно это характерно для стран Африки, однако быстрый рост числа детей-сирот, скорее всего, разрушит традиционную систему поддержки в рамках расширенной семьи. Многие домашние хозяйства, взявшие на себя заботу о сиротах, сами живут в условиях нищеты и принимаемые ими дети-сироты создают для них значительные проблемы.

Воздействие ВИЧ/СПИД на предпринимательскую деятельность

ВИЧ/СПИД оказывает негативное воздействие на деятельность предприятий как в сельскохозяйственном, так и в несельскохозяйственных секторах. По данным проведенных исследований воздействия ВИЧ/СПИД, это заболевание влияет на численность и качество рабочей силы и на ее стоимость, поскольку наиболее продуктивные работники по мере развития болезни работают все менее эффективно или оказываются неспособными работать вообще и в конечном счете умирают. Потеря работников вследствие заболевания СПИДом и расходы на выплату пособий на медицинское обслуживание и пособий в связи со смертью имеют серьезные последствия для работодателей.

Степень воздействия на компании зависит в первую очередь от следующих пяти факторов: числа инфицированных работников; их роли в компании; структуры производства и возможностей адаптации к сокращению числа работников; производимых компанией выплат на медицинское обслуживание; и влияния ВИЧ/СПИД на хозяйственную конъюнктуру. На ранних стадиях болезни работники, как правило, могут продолжать выполнять свои обязанности, однако они чаще берут больничные и отпуска. Компании, выплачивающие работникам и их семьям пособия на медицинское обслуживание, могут оказаться не в состоянии покрывать медицинские расходы и оплачивать дорогостоящие лекарства, используемые для лечения ВИЧ/СПИД. Так, по данным исследования, проведенного в Малави, в одной из компаний за пять лет умерло более 40 процентов всех работников, что привело к резкому увеличению ее расходов на выплату пособий в связи со смертью.

Бóльшая вероятность инфицирования ВИЧ и еще бóльшая вероятность смерти от СПИДа существует среди молодых людей самого продуктивного возраста. Степень негативного воздействия на производство и управление зависит от того, какие должности занимают инфицированные работники. Сложнее всего найти замену работникам с высочайшей квалификацией и большим трудовым стажем. Кроме того, поскольку для затрагиваемых этой проблемой домашних хозяйств характерны более низкие уровни дохода и потребления, это может стать причиной падения спроса на товары и услуги.

Воздействие ВИЧ/СПИД на сельское хозяйство

ВИЧ/СПИД имеет катастрофические последствия для сельскохозяйственного производства и экономической жизнеспособности небольших фермерских хозяйств и коммерческих производителей сельхозпродукции. Продовольственная и сельскохозяйственная организация Объединенных Наций (ФАО) установила, что к 2020 году в десяти африканских странах, в наибольшей степени затронутых проблемой ВИЧ/СПИД, число сельскохозяйственных рабочих сократится на 10–26 процентов. Ботсвана, Зимбабве, Мозамбик и Намибия потеряют не менее пятой части работников в этом секторе.

Утрата части рабочей силы в сельском хозяйстве ведет к сокращению площади возделываемых земель, переходу на культуры, требующие меньших затрат труда, падению урожайности и нехватке рабочей силы в периоды повышенного спроса на нее. Следствием эпидемии является также утрата агротехнических знаний и сокращение

доли квалифицированных и опытных работников. В ходе проведенного в Зимбабве обследования было установлено, что в домашних хозяйствах, затронутых проблемой СПИДа, производство сельхозпродукции упало почти на 50 процентов. По данным другого исследования, посвященного коммерческим производителям сельхозпродукции в Кении, заболеваемость и смертность, связанные со СПИДом, уже привели к резкому увеличению финансовых, экономических и социальных издержек.

Воздействие ВИЧ/СПИД на сферу здравоохранения

Во многих серьезно затронутых проблемой ВИЧ/СПИД странах отставание в развитии сферы здравоохранения наблюдалось еще до возникновения эпидемии. Эпидемия ВИЧ/СПИД создала множество дополнительных проблем в этой сфере, так как ее следствием явилось резкое увеличение расходов на медицинское обслуживание и исчерпание возможностей систем медицинского страхования. Кроме того, заболевают и умирают сами медицинские работники. В результате этого предложение доступных медицинских услуг сокращается, а спрос увеличивается.

Растут расходы на лечение как самого СПИДа, так и условно-патогенных заболеваний, характерных для лиц, иммунная система которых ослаблена ВИЧ/СПИД. Выделение скудных ресурсов на лечение ВИЧ/СПИД означало сокращение финансирования на цели решения других задач в области здравоохранения. Поскольку вследствие эпидемии СПИДа правительства стали испытывать все большие трудности с обеспечением медицинского обслуживания в рамках государственного сектора, все бóльшую долю расходов в этой области вынуждены брать на себя частный сектор, домашние хозяйства и каждый отдельный человек.

Воздействие ВИЧ/СПИД на образование

ВИЧ/СПИД подрывает те успехи, которые были достигнуты в области обеспечения всеобщего начального образования. СПИД ослабляет потенциал системы образования и снижает посещаемость в школах. В долгосрочном плане эпидемия СПИДа может привести к падению уровня и качества образования, что в свою очередь негативно скажется на человеческом потенциале и темпах социального и экономического развития.

В ходе исследований было выявлено широкое распространение ВИЧ-инфекции среди учителей и работников сферы образования, что подрывает образовательный потенциал в количественном и качественном отношении. Сложно найти замену квалифицированным и опытным учителям. По данным обследования, проведенного Детским фондом Организации Объединенных Наций (ЮНИСЕФ), число учителей, умерших в 1998 году в Замбии, эквивалентно двум третям всех выпускников педагогических курсов того года. В силу обстоятельств опытных учителей замещают менее опытные; как следствие, падает качество образования. Проблема качества усугубляется также нарушением учебного процесса вследствие частого невыхода учителей на работу.

Кроме того, как показывают исследования, дети из семей, в которых есть ВИЧ-инфицированные, чаще бросают школу. Это вызвано необходимостью оказания помощи по дому или работы по найму. Менее

состоятельные семьи не могут позволить себе платить за обучение детей. В ходе исследования, проведенного в одном из районов Уганды с высоким показателем распространения ВИЧ/СПИД, было установлено, что за период с 1989 по 1993 год общее число детей, обучающихся в трех начальных школах, сократилось на 60 процентов. Сироты, потерявшие обоих родителей, как правило, чаще, чем другие дети, не посещают школу. По данным обследования домашних хозяйств в Кампале, Уганда, в 1990 году достаточными средствами для направления своих детей в школу не располагали 47 процентов домашних хозяйств, в состав которых входили сироты, и 10 процентов домашних хозяйств всех других категорий.

Воздействие ВИЧ/СПИД на экономический рост

Эпидемия ВИЧ/СПИД — тяжкое бремя для экономики любой страны. Это особенно верно в отношении стран со слабой экономикой, каковыми, как правило, и являются страны с высокими показателями распространения ВИЧ-инфекции среди населения. Во многих странах, в значительной степени затронутых этой проблемой, были проведены исследования с целью смоделировать воздействие ВИЧ/СПИД на экономический рост. В одних случаях экономическое воздействие ВИЧ/СПИД было оценено как «незначительное». В других случаях был сделан вывод о ежегодном сокращении валового внутреннего продукта на 2–4 процентных пункта по сравнению с гипотетической ситуацией «полного отсутствия заболеваемости СПИДом». Помимо влияния на валовой внутренний продукт, эпидемия ВИЧ/СПИД, по всей видимости, усугубляет неравенство доходов и обостряет проблему нищеты.

Долгосрочное воздействие ВИЧ/СПИД на благосостояние и развитие, несомненно, является более серьезным, чем то, что вытекает из экономического анализа. В оценках воздействия ВИЧ-инфекции на экономические показатели, как правило, не учитывается потеря «социального капитала» или «накапливаемый» ущерб, который будет причинен человеческому капиталу в будущем, хотя ВИЧ/СПИД оказывает прямое и косвенное негативное влияние на образование, питание и здоровье детей. Меньшие вложения в человеческий капитал подрастающего поколения неизбежно скажутся на экономических показателях через несколько десятилетий, то есть значительно позже того временно́го периода, который в большинстве случаев охватывается экономическим анализом.

Выводы

На своей двадцать шестой специальной сессии, состоявшейся 25–27 июня 2001 года в Нью-Йорке, Генеральная Ассамблея в своей резолюции 26-S/2 (приложение) приняла Декларацию о приверженности делу борьбы с ВИЧ/СПИД. В этой Декларации говорится, что «… глобальная эпидемия ВИЧ/СПИД, достигшая ужасающих масштабов и оказывающая опустошительное воздействие, представляет собой глобальную чрезвычайную ситуацию и одну из самых серьезных угроз жизни и достоинству человека, а также эффективному осуществлению прав человека, которая подрывает социально-экономическое развитие по всему миру и затрагивает все слои общества — нацию, общину, семью и каждого отдельного человека».

С момента принятия Декларации о приверженности эпидемия ВИЧ/СПИД обострилась и расширилась. В представленном на пятьдесят восьмой сессии Генеральной Ассамблеи докладе Генерального секретаря о прогрессе в осуществлении Декларации о приверженности делу борьбы с ВИЧ/СПИД подчеркивается, что для предотвращения значительного распространения ВИЧ/СПИД требуются сильное политическое руководство и эффективные действия. В докладе всем странам рекомендуется разработать и осуществлять национальные стратегии комплексной профилактики, а также лечения и поддержки людей, инфицированных ВИЧ/СПИД или затронутых этой проблемой.

Для того чтобы победить ВИЧ/СПИД, потребуются значительно бóльшие усилия и ресурсы. Как отметил Генеральный секретарь в заключительной части своего доклада, «… в целях финансирования глобальных мер реагирования … ежегодное финансирование программ борьбы с ВИЧ/СПИД должно увеличиться по сравнению с нынешним уровнем в три раза к 2005 году и в пять раз — к 2007 году».

Предугадать, как будет развиваться эпидемия ВИЧ/СПИД, невозможно. Это будет зависеть от того, какие меры в ответ на угрозу ВИЧ/СПИД будет принимать каждый отдельный человек, общины, нации и весь мир сегодня и завтра.

RESUMEN EJECUTIVO

El VIH/SIDA es la epidemia de mayor mortandad de nuestra época. Más de 22 millones de seres humanos ya han perdido la vida y más de 42 millones viven actualmente con el VIH/SIDA. Aun si se descubriera hoy una vacuna contra el VIH/SIDA, de todas formas morirían prematuramente, debido al SIDA, más de 40 millones de personas. En muchos países, particularmente en África y en los países más afectados, como Botswana, Swazilandia y Zimbabwe, la epidemia del SIDA se ha propagado rápidamente, dejando tras de sí una estela de enfermedad, muerte, pobreza y dolor. En otros países la enfermedad se encuentra aún en sus primeras etapas. Recientemente el VIH/SIDA ha ganado fuerza en los países de mayor población del mundo. El número de infectados con el VIH ha llegado a 1 millón en China y a 6 millones en la India. Ya comienzan a hacerse sentir en esos países los efectos destructivos de la epidemia.

La epidemia no sólo ha cobrado la vida de seres humanos, sino que, además, ha impuesto una pesada carga en las familias, las comunidades y las economías. El dolor y la devastación que ya ha causado el VIH/SIDA es enorme, pero lo más probable es que los efectos venideros sean aún mayores, al seguir aumentando la incidencia de la enfermedad en un numero creciente de paises. Es difícil predecir con certeza el curso futuro de la epidemia. Mucho depende de que:

- Se eduque a la población acerca de los peligros del virus y se la persuada a modificar su conducta;
- Se encuentren formas efectivas de impedir que se siga propagando el virus;
- Se descubran nuevos medicamentos y tratamientos;
- Se movilicen los recursos financieros y humanos necesarios para llevar a cabo estas tareas.

Poco después de declararse la epidemia, la División de Población del Departamento de Asuntos Económicos y Sociales empezó a estudiar la demografía del VIH/SIDA e incorporó el impacto del VIH/SIDA en las revisiones bienales de las estimaciones y proyecciones oficiales de las Naciones Unidas relativas a la población mundial[1]. El presente informe abarca un campo mayor, pues en él se analiza el impacto, más amplio, del VIH/SIDA en el desarrollo. El informe es una contribución al 38° período de sesiones de la Comisión de Población y Desarrollo, que se celebrará en 2005, con el tema "La población, el desarrollo y el VIH/SIDA, con especial referencia a la pobreza". En él se presenta, además un panorama general de toda la gama de consecuencias de la epidemia del SIDA, que servirá de base para la revision que deberá hacer en 2005 la Asamblea General sobre la aplicación de la Declaración de compromiso de las Naciones Unidas en la lucha contra el VIH/SIDA, aprobada en 2001 (A/RES/S-26/2).

[1] *World Population Prospects: The 2002 Revision* (publicación de la División de Población del Departamento de Asuntos Económicos y Sociales de las Naciones Unidas), número de venta: E.03.XIII.6).

Además de analizar el impacto demográfico del VIH/SIDA, el estudio destaca también los efectos del VIH/SIDA en las familias y los hogares, en la sostenibilidad agrícola, la actividad económica, el sector de la salud, la educación y el crecimiento económico de los países. La epidemia del VIH/SIDA ha anulado decenios de progreso en la lucha contra la mortalidad y ha comprometido gravemente las condiciones de vida de las generaciones actuales y futuras. La enfermedad produce efectos de esa magnitud porque debilita y da muerte a muchos adultos jóvenes, es decir, cuando se encuentran en los años más productivos para generar ingresos y cuidar las familias. Al destruir las familias, elimina a toda una generación de importancia crítica para la supervivencia de los integrantes de la sociedad más jóvenes y de mayor edad.

El impacto demográfico del VIH/SIDA

El VIH/SIDA ha tenido ya un impacto demográfico devastador, sobre todo en el África al sur del Sáhara. Se ha traducido en terribles pérdidas de vida y población**.** Las proyecciones de población recientes de las Naciones Unidas se prevén pérdidas aun más drásticas para los decenios venideros.

En *World Population Prospects: The 2002 Revision* (Perspectivas de la población mundial: revisión de 2002), publicación en que se consignan las estimaciones y proyecciones oficiales de las Naciones Unidas respecto de la población mundial, se incorporaron los efectos del VIH/SIDA en los 53 países más afectados, que es donde se encuentra más del 90% de los adultos que viven con VIH/SIDA. En esos 53 países, el número anual de defunciones adicionales había llegado a 1 millón de personas a principios del decenio de 1990, a 3 millones en 2000 y a más de 4 millones en 2003.

Treinta y ocho de los 53 países, es decir, tres de cada cuatro, se encuentran en el África al sur del Sáhara. Se prevé que en esos países africanos, hasta 2025, se producirán 100 millones de muertes adicionales a consecuencia de la epidemia de VIH. En 2025, esos países tendrán un 14% menos de habitantes que si no se hubiera producido la epidemia**,**

Aunque los efectos demográficos del VIH/SIDA en los países fuera de África son relativamente moderados y las tasas de incidencia menores, la pérdida de vidas sigue siendo enorme. Se prevé que, hasta 2025, el SIDA causará otros 31 millones de muertes en la India y otros 18 millones en China.

La mortalidad ha aumentado considerablemente en los países con alta prevalencia de VIH; en un decenio ha llegado a niveles sin precedentes desde el decenio de 1950 o el de 1960. En los 38 países africanos más afectados, en 2020-2025, se habrán perdido casi 10 años de esperanza de vida; en los siete países de mayor prevalencia, se habrán perdido casi 30 años de esperanza de vida. Fuera de África, entre los países que se prevé que sufrirán una reducción considerable de la esperanza de vida se cuentan las Bahamas, Camboya, Haití, Myanmar y la República Dominicana.

Actualmente Botswana tiene la más alta tasa de prevalencia de VIH del mundo: más de uno de cada tres adultos es seropositivo. La esperanza de vida había alcanzado los 65 años en 1990-1995, pero se redujo a 56 años en 1995-2000 y actualmente es de aproximadamente 40 años, como resultado de la mortalidad provocada por el SIDA. Dentro de pocos años probablemente también comenzará a disminuir la población. Si bien aún no se hace sentir plenamente el impacto económico del VIH/SIDA, las proyecciones de población pa-

ra Botswana indican que en 2025 habrá un grave déficit de habitantes en edad de trabajar.

El impacto del VIH/SIDA en las familias y los hogares

El impacto inmediato de la epidemia de VIH/SIDA se hace sentir en los hogares. De hecho, las familias y los hogares llevan la carga más onerosa por ser las unidades primarias que deben hacer frente a la enfermedad y sus consecuencias. Las familias en que la persona infectada es la fuente de ingresos sufren, desde el punto de vista financiero, tanto por la pérdida de ingresos como por el aumento de los gastos de atención médica. Los hogares se van empobreciendo durante los largos períodos de enfermedad, debido a la pérdida de ingresos y a los costos de atender al familiar afectado. Diversos estudios atestiguan que baja el nivel de consumo de los hogares, incluso en concepto de alimentos, lo que desemboca en malnutrición. La epidemia de VIH/SIDA plantea problemas adicionales en los lugares en que la enfermedad va acompañada de un grave estigma social.

Como las infecciones con VIH/SIDA se producen principalmente entre los adultos jóvenes, se pierde una proporción importante de la generación de padres jóvenes, con lo que la composición de las familias se modifica rápidamente. En los países muy afectados, aumenta el porcentaje de hogares encabezados por mujeres y abuelos, así como por huérfanos jóvenes. Cuando muere un miembro de la familia, el hogar puede quedar totalmente desarticulado y los niños deben irse a vivir con parientes o bien quedan abandonados a su suerte.

La enfermedad o muerte de un cónyuge tiene efectos particularmente severos en las sociedades en que la división del trabajo obedece principalmente a consideraciones de género, ya que el cónyuge que sobrevive no puede asumir el trabajo ni las responsabilidades del cónyuge enfermo o que ha fallecido. Por ejemplo, en el distrito Rakai de Uganda, las muertes ocasionadas por el SIDA han causado escasez de mano de obra en las labores agrícolas y domésticas.

En 2001, 14 millones de niños menores de 15 años habían perdido a uno o ambos padres debido al VIH/SIDA. De esos niños, 11 millones viven en el África al sur del Sáhara. Es probable que las cifras se dupliquen en 2010. Es común que los familiares acojan a los huérfanos en sus hogares, sobre todo en las sociedades africanas, pero el rápido aumento del número de huérfanos no puede menos que rebasar el sistema tradicional de apoyo de las familias extendidas. Muchos de los hogares a que llegan los huérfanos ya son pobres, por lo que darles lugar representa una carga importante.

El impacto del VIH/SIDA en las empresas

La enfermedad afecta a las empresas comerciales tanto de los sectores agrícolas como no agrícolas. En los estudios disponibles sobre el impacto del VIH/SIDA se destaca el observado en el tamaño y la calidad de la mano de obra y en el costo de ésta cuando los trabajadores más productivos están demasiado enfermos para trabajar bien o siquiera trabajar y, a la postre, mueren. La pérdida de trabajadores debido al SIDA y los costos de proporcionar prestaciones de atención de la salud y por defunción han repercutido considerablemente en los empleadores.

El impacto en las empresas depende primordialmente de cinco factores: el número de empleados infectados; la función de éstos en la empresa; la estructura del proceso de producción y la capacidad de ésta para hacer frente a la pérdida de empleados; las prestaciones de atención de la salud que proporciona la empresa; y los efectos del VIH/SIDA en el entorno comercial. Lo más corriente es que en la primera etapa de la enfermedad los trabajadores puedan seguir trabajando, pero tomando más días de licencia anual o por enfermedad. Puede suceder que las compañías que otorgan prestaciones de enfermedad a los trabajadores y sus familias no estén en condiciones de pagar los gastos de atención de la salud ni los caros medicamentos que se utilizan en el tratamiento del VIH/SIDA. Por ejemplo, en un estudio hecho en Malawi se determinó que, en un período de cinco años, el número de muertes en una empresa había aumentado más de un 40%, lo que se había traducido en un aumento considerable de los pagos de prestaciones por defunción.

Los que tienen más probabilidades de contraer el VIH son los adultos jóvenes en sus mejores años de trabajo; los trabajadores jóvenes representan un número desproporcionado de las muertes por SIDA. Según los puestos que ocupen los trabajadores infectados, los efectos se hacen sentir en la producción y en la administración de la empresa. Los trabajadores más difíciles de reemplazar son los más cualificados y con mayor experiencia. Puede suceder también que se reduzca la demanda de bienes y servicios debido a que las familias afectadas tienen menos ingresos y acusan niveles más bajos de consumo.

El impacto del VIH/SIDA en la agricultura

El VIH/SIDA tiene efectos devastadores en la producción agrícola y en la viabilidad económica de las explotaciones agrícolas pequeñas y las empresas agrícolas comerciales. La Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO) ha determinado que en los 10 países africanos más afectados por el VIH/SIDA, en 2020 la mano de obra agrícola se habrá reducido entre 10% y 26%. Se calcula que en Botswana, Mozambique, Namibia y Zimbabwe se perderá por lo menos la quinta parte de los trabajadores agrícolas.

Entre las consecuencias de la pérdida de trabajadores agrícolas se cuentan la reducción de la tierra labrantía en explotación, el paso a cultivos que exigen menos mano de obra, la reducción del rendimiento de las cosechas y una escasez de mano de obra en los períodos de mayor demanda de trabajadores. La epidemia también acarrea la pérdida de conocimientos de métodos agrícolas y una reducción del número de trabajadores cualificados y con experiencia. Una encuesta realizada en Zimbabwe determinó que en los hogares afectados por el SIDA la producción agrícola se había reducido en casi un 50%. Otro estudio, centrado en el sector agrícola comercial de Kenya, determinó que la morbilidad y mortalidad causada por el SIDA ya había causado profundos costos financieros, económicos y sociales.

El impacto del VIH/SIDA en los sistemas de salud

En muchos de los países más afectados, los sistemas de salud eran insuficientes aun antes del arribo del VIH/SIDA. La epidemia ha impuesto enormes demandas adicionales a esos sistemas, presionando al máximo los presupuestos de salud y los planes de seguros médicos. Además, los propios trabajadores de la salud están cayendo enfermos o muriendo, presa de la epidemia. Por lo tanto, a la vez que aumenta la demanda, se está reduciendo la oferta de servicios de salud disponibles.

Han venido aumentado los gastos correspondientes al tratamiento del SIDA y de las infecciones oportunistas comunes en las personas cuyos sistemas de inmunidad se han visto comprometidos por el VIH/SIDA. La asignación de los escasos recursos disponibles al tratamiento del VIH/SIDA ha reducido la atención que se presta a otros problemas de salud. Como los gobiernos, ante la epidemia del SIDA, se ven cada vez más exigidos para prestar servicios de salud por conducto del sector público, los gastos pertinentes, cada vez en mayor medida, deben correr por cuenta del sector privado y de los propios hogares y los particulares.

El impacto del VIH/SIDA en la enseñanza

El VIH/SIDA está anulando los progresos que se habían alcanzado para lograr una enseñanza primaria universal. El SIDA debilita los sistemas de enseñanza y conspira contra la asistencia de los niños a las escuelas. Es posible que, a la larga, la epidemia del SIDA se traduzca en una baja del nivel y la calidad de la enseñanza, lo que reduciría el capital humano y retrasaría el desarrollo económico y social.

Los estudios realizados han revelado la existencia de una alta tasa de infección por VIH entre los maestros y administradores escolares, lo que afecta tanto a la calidad como a la cantidad de los recursos educativos. Es difícil reemplazar a los maestros con experiencia. Según un estudio del Fondo de las Naciones Unidas para la Infancia (UNICEF), el número de defunciones de maestros ocurridas en Zambia en 1998 equivalió a perder aproximadamente dos terceras partes de los maestros que se capacitan anualmente. Por fuerza, los maestros con experiencia son reemplazados por maestros de menos experiencia y, por ende, baja la calidad de la educación. La calidad también se ve comprometida cuando el ausentismo de los maestros incide negativamente en el proceso de aprendizaje de sus alumnos.

Por otra parte, diversos estudios indican que los niños de las familias en que hay una persona infectada tienen menos probabilidades que los demás de seguir asistiendo a la escuela. Se les necesita para que ayuden en el hogar o salgan a trabajar. Las familias con menos medios no pueden pagar los gastos escolares. Según un estudio realizado en un distrito de Uganda con una alta tasa de infección, la matrícula total de tres escuelas primarias había experimentado una baja de un 60% entre 1989 y 1993. De la misma forma, los huérfanos de padre y madre tienen muchas menos probabilidades de seguir asistiendo a la escuela que otros niños. Una encuesta por hogares realizada en Kampala (Uganda) determinó que, en 1990, el 47% de los hogares en que había huérfanos no tenían suficiente dinero para enviar los niños a la escuela, en comparación con el 10% de los demás hogares.

El impacto del VIH/SIDA en el crecimiento económico

La epidemia de VIH/SIDA representa una carga para la economía de cualquier país. Ello se aplica, en especial, a las economías débiles características de los países con altos niveles de prevalencia de VIH. En muchos de los países más afectados se han realizado estudios para preparar modelos sobre el impacto del VIH/SIDA en el crecimiento económico. En algunos casos, las estimaciones del impacto económico del VIH/SIDA han sido "bajas"; en otros, se han determinado reducciones anuales entre 2% y 4% del producto interno bruto anual, respecto de una situación hipotética en que no hay SIDA. Más allá de esos efectos en el producto interno bruto, lo más probable es que la epide-

mia del VIH/SIDA exacerbe la desigualdad de ingresos y haga aumentar la pobreza.

Evidentemente, los efectos a largo plazo del VIH/SIDA en el bienestar y el desarrollo son más graves de lo que indican los análisis económicos. Por lo general, en las estimaciones de los efectos del SIDA en la actividad económica no se tienen en cuenta la pérdida de "capital social" ni los daños a largo plazo que sufre el capital humano, ya que el VIH/SIDA afecta directa e indirectamente a la educación, la nutrición y la salud de los niños. Las consecuencias de que se reduzca la inversión en el capital humano de las generaciones más jóvenes se harán sentir en el rendimiento económico durante decenios, y rebasarán mucho el período que abarca la mayoría de los análisis económicos.

Conclusiones

En su resolución 26-S/2 (anexo), la Asamblea General, en su vigésimo sexto período extraordinario de sesiones, celebrado en Nueva York del 25 al 27 de junio de 2001, aprobó la Declaración de compromiso en la lucha contra el VIH/SIDA. En ella se señala que "la epidemia mundial de VIH/SIDA, por sus dimensiones y consecuencias devastadoras, constituye una emergencia mundial y uno de los desafíos más graves para la vida y la dignidad del ser humano, así como para el disfrute efectivo de los derechos humanos, que socava el desarrollo económico y social en todo el mundo y afecta a todos los niveles de la sociedad: individual, familiar, comunitario y nacional".

Desde la aprobación de la Declaración de compromiso, la epidemia de VIH/SIDA sigue propagándose. En el informe presentado por el Secretario General a la Asamblea General en su quincuagésimo octavo período de sesiones sobre los logros alcanzados en la aplicación de la Declaración de compromiso en la lucha contra el VIH/SIDA, se hace hincapié en la necesidad de una dirección política enérgica y de medidas eficaces para evitar una expansión de grandes dimensiones del VIH/SIDA. En el informe se recomienda que todos los países elaboren y ejecuten estrategias nacionales que promuevan la prestación de actividades de prevención, tratamiento, atención y apoyo integrales a las personas que vivan con el VIH/SIDA o estén afectadas por él.

Para vencer el VIH/SIDA, se necesitará aumentar en mayor medida las actividades y los recursos necesarios para ese fin. La conclusión a que llegó el Secretario General en su informe fue que "para financiar la respuesta mundial ..., el nivel actual de financiación anual de la lucha contra el VIH/SIDA debe triplicarse hasta el 2005 y quintuplicarse hasta el 2007".

El curso de la epidemia de VIH/SIDA dista mucho de estar predeterminado. A la larga, dependerá de la forma en que las personas, las comunidades, las naciones y el mundo respondan hoy y mañana a la amenaza que plantea el VIH/SIDA.

INTRODUCTION

The health and mortality of those living with HIV and AIDS and the demographic effects of AIDS mortality are the focus of much research attention, but the wider implications of the epidemic are less well explored. HIV/AIDS will have long-term effects on families, communities, enterprises, agriculture and the well-being and economic future of society as a whole. Where the disease gained an early foothold and has had the time and opportunity to spread, the consequences are already apparent. As more countries experience outbreaks of the disease, the effects in today's high-prevalence countries are likely to be played out in settings all over the world.

Since 1981, when the first cases of AIDS were diagnosed, AIDS-related mortality has reached orders of magnitude comparable to those associated with visitations of pestilence in earlier centuries. The Black Death of 1347-1351 killed more than 20 million people in Europe; by the end of 2002, 22 million people had lost their lives to AIDS, and more than 42 million were living with HIV/AIDS. The future course of the disease and its real magnitude remain unknown. Thus, it is of paramount importance to understand the impact of the pandemic, to present the current state of knowledge of its impact and to identify areas where research is vitally needed.

In many developing countries, the effects of the HIV/AIDS epidemic, combined with the economic recessions of the 1970s and 1980s, have erased decades of demographic and economic progress and have seriously compromised the living conditions of future generations (Nicoll and others, 1994). The disease has such a staggering impact because it weakens and kills many people in their young adulthood, the most productive years for income-generation and family caregiving. It collapses and breaks up families by eliminating the generation that is important to the survival of society's youngest and oldest members.

The HIV/AIDS epidemic affects every aspect of human life. It has imposed heavy burdens on individuals, families, communities and nations. The present publication documents the wide-ranging impacts of HIV/AIDS on families and households; agricultural sustainability; business; the health sector; education; and economic growth. The study also shows that the AIDS epidemic will continue to have devastating consequences for decades to come for virtually every sector of society. In many countries, the epidemic is undermining the achievement of the goals outlined in the Millennium Declaration adopted by the General Assembly in 2000. Accordingly, immediate action and investments in policies and programmes will be able to save millions of lives and mitigate the destructive consequences of an unchecked epidemic.

The Impact of AIDS is organized into ten chapters. The first chapter considers the data, sources and methods for studying the impact of the AIDS epidemic. The second chapter looks at the current and projected future demographic impact of the epidemic, particularly for the 53 most affected countries. The third chapter deals with the impact of HIV/AIDS on families and households, the units of society that are most directly affected when a member contracts the disease. The next two chapters address production sectors of the economy, namely, firms and agriculture. The loss of large numbers of workers owing to illness or death disrupts the supply of food and manufactured goods and has ramifications for the functioning of the whole economy.

Chapters VI and VII discuss the education and health sectors, both areas of human capital investment important to a nation's future economic development. Education has already been adversely affected by the HIV/AIDS epidemic. Not only have many teachers and school administrators been stricken with the disease, but

children have been forced to drop out of school to help care for family members who are ill or to replace the labour of those who can no longer work. The loss of schooling for future generations may be the most long-lasting and crippling legacy of the disease. The health sector is most directly involved in dealing with the victims of HIV/AIDS, especially in caring for those infected but also in helping to prevent further transmission of the virus. Chapter VIII focuses on the impact of the AIDS epidemic on national economic growth, including the macroeconomic models that have been constructed to predict future economic growth in the age of HIV/AIDS. A summary and conclusions to the study are given in chapter IX. Chapter X provides descriptions and findings of selected studies used in preparing the present report.

PART ONE

I. DATA, SOURCES AND METHODS

The studies described in *The Impact of AIDS* use a wide variety of sources and methods to collect and analyse data and arrive at conclusions concerning the impact of HIV/AIDS on particular sectors of the economy. Each methodology has its own strengths and limitations, as described below. The choice of methodology and research design has direct implications for the quality and usefulness of the results. Larger, more representative samples are more likely to produce findings that can be broadly generalized, whereas qualitative studies that rely on small samples and anecdotal accounts are of less statistical value. The reader is cautioned that the quality of the studies reviewed in this volume is uneven. Moreover, since people in many societies associate the disease with shame and stigma and are reluctant to discuss it, investigation of a subject as sensitive as HIV/AIDS presents problems for the researcher. That concern underlies the difficulty of measuring the exact magnitude of the impact of HIV/AIDS and the need to design and implement more rigorous and more appropriate research.

Chapter I examines the types of methodologies common to studies of the impact of HIV/AIDS and identifies areas where future research is urgently needed. In some cases, the methodology was appropriate for only one sector; in other cases, the same methodology could be applied to measure the impact in several sectors. Some research combined several methodologies and assembled data from a variety of sources. Many studies, especially those that served as the basis for the analysis in chapter III on households and families, used retrospective interviews with subjects, although a few studies with longitudinal surveys were available. Data collection from official government records formed the basis for some investigations, especially in the education and health sectors. Studies on firms and agricultural enterprises focused mainly on company records of employment, productivity and health. In the macroeconomic studies of the impact of HIV/AIDS, virtually all efforts employed economic modelling, although the models differed according to the inputs selected and assumptions underlying the model. Finally, a number of studies used evidence that was not easily verifiable or quantifiable, such as semi-structured interviews and focus groups. That approach was often a supplement to other lines of evidence.

Part I of the report is an attempt to provide a comprehensive survey of studies that were available from published and electronic sources as conference papers, United Nations reports and communications from individual scholars. Some of the studies were preliminary reports on research in progress and were not formally reviewed and published or did not give a full account of the research carried out. Part II of the report presents summaries of selected studies, with particular attention to the methodology and scope of each study. Overall, the body of data is enormous and changes rapidly. As the implications of the epidemic for all facets of human life become ever more apparent, the need for research to guide policies and programmes escalates.

A. METHODOLOGIES OF STUDIES

1. *Demography*

For countries that are severely affected by HIV/AIDS, the demographic impact of HIV/AIDS was assessed by comparing population estimates and projections based on realistic assumptions about the course of the epidemic with hypothetical estimates and projections that make no allowance for the existence of AIDS. The latter are derived from the application of the DESA Population Division standard computer projection program, on the basis of assumptions regarding the future course of mortality that are similar to and consistent with those made with respect to countries that are still largely free from the HIV/AIDS epidemic. The process for deriving estimates and projections that explicitly incorporate the effect of HIV/AIDS is more complex and involves several steps (see Buettner, Sawyer and Zlotnik, 2003). HIV and AIDS estimates were produced by the Joint

United Nations Programme on HIV/AIDS (UNAIDS) so that the results of the projections are consistent with those estimates.

For the 2002 revision of the United Nations official world population estimates and projections (United Nations, 2003d, 2003e, and 2003f), the impact of the HIV/AIDS epidemic was explicitly modelled for 53 countries, up from 45 in the *World Population Prospects: The 2000 Revision.* In most of those countries, HIV prevalence in 2001 was estimated to be 2 per cent or more among the population aged 15-49. In addition, a few populous countries with lower prevalence levels were included because they had a large number of persons (at least one million) living with HIV.

2. *Households and families*

Most of the studies in chapter III were based on retrospective surveys, which use a single interview with respondents and require them to recall events that occurred in the past. If respondents forget some events, results may be biased. Retrospective studies also make it difficult to establish causality. For example, malnutrition in children may be associated with loss of income due to AIDS-related medical expenses, but it cannot be determined whether the children were already malnourished before the disease depleted the income of the household or whether the loss of income caused their malnourishment.

Longitudinal, or follow-up, surveys interview the same respondents at more than one point in time and thus allow timely recording of events, such as AIDS deaths. This type of survey reduces errors caused by memory lapse, but is more expensive to conduct and is subject to attrition of respondents. The present volume provides examples of follow-up surveys, including a study of economic activities in households in Burundi, Côte d'Ivoire and Haiti conducted by the International Children's Centre in the early 1990s and a study in Rakai, Uganda that looked at the ownership of durable goods in households with and without an adult AIDS death. The use of a control group in the Rakai study was a methodological improvement that allowed comparison of the two groups of households and made it possible to show the actual effect of AIDS-related mortality on the economic fortunes of households. A study in Thailand further subdivided households into those with no death, those with an adult AIDS-related death and those with an adult death not related to AIDS. The study demonstrated that AIDS-related deaths were more costly to households than non-AIDS-related deaths, although both suffered the loss of earnings of the deceased.

A problem with the use of surveys when studying HIV/AIDS in households and families is that an adult death, particularly the death of the breadwinner, may cause the family to break up. Some family members may migrate out of the area, and young children may be adopted by relatives. Consequently, families that have suffered AIDS deaths may no longer exist and may be underrepresented in the survey sample.

3. *Firms*

The methodology employed by most of the studies on firms includes examination of company records for information about employment, absenteeism and productivity; interviews with company officers, managers, supervisors and doctors; and economic modelling to determine future workforce needs. Most studies were commissioned by the company involved. There may be many additional studies of this type, but the results are generally not available to the public. The methodology is often not documented in detail, and the outcomes of interest are related to company profitability, focusing on such concerns as workers' insurance and benefit costs, medical care and the costs of recruiting and training new employees to replace those who have died of AIDS.

Studies of firms may have empirical data on the HIV status of employees through medical insurance records and company-wide testing, permitting assessment of the actual impact of the HIV/AIDS epidemic. In some other sectors, where there is no independent confirmation of the HIV/AIDS diagnosis, the cause of death may only be assumed to be AIDS.

Company records can measure the direct costs of HIV/AIDS, but other indirect costs are less measurable and less quantifiable. The latter in-

clude the morale and motivation of workers in a setting where their co-workers are becoming ill and dying.

4. *Agriculture*

Methodologies to measure the impact of HIV/AIDS on agriculture have included such approaches as household interviews and focus groups of farm owners and managers. In the case of such agricultural enterprises as tea estates and sugar mills, the methodology is similar to that for firms. For example, a study of a sugar mill in rural South Africa used clinic and hospital records, employment records and household interviews. It was one of the most comprehensive research studies involving agricultural workers as a result of the combination of methodologies employed.

An approach unique to research in agricultural areas is known as rapid rural appraisal. It is a qualitative survey methodology that uses a multidisciplinary team to formulate problems for agricultural research and development. Its chief characteristics are the short period of investigation, the use of informal data-collection methods and the relatively low cost of the research. Rapid rural appraisal relies on expert observation coupled with semi-structured interviewing of farmers, local leaders and officials. This type of research has been carried out in Uganda, the United Republic of Tanzania and Zambia, among other places. The principal advantage of the method is that it produces quick answers to research questions, but the disadvantage is that the superficial nature of data collection may lead to biased results.

Many studies of agriculture included no control group that would have allowed researchers to estimate what portion of the findings was due solely to the HIV/AIDS epidemic. For example, a study in Zimbabwe examined the impact of HIV/AIDS on the agricultural production of AIDS-affected households. However, it did not include a sample of families not affected by AIDS, so the difference between the two types of households could not be measured. Another problem common in agricultural studies was the lack of knowledge of the HIV status of individuals.

5. *Education*

The studies on education understandably focused on areas where data were available—the supply of education (the numbers of teachers and resources available) and the demand for education (the numbers of children by age). The quality of education was rarely assessed, although it was implicit in some studies that experienced teachers provided higher-quality education, so their loss to AIDS compromised quality. School records were an important source of data, as were interviews with school administrators, teachers and parents.

Focus group discussions were used in a number of studies. In Zambia, focus group discussions with members of AIDS-affected households explored the conditions that led parents to take their children out of school. Focus groups may help make it possible to understand the impact of HIV/AIDS as individuals directly affected by the epidemic perceive it. For example, a study in the Ondangwa East and Ondangwa West regions of Zambia used focus groups and in-depth interviews to examine the reality faced by teachers and school principals.

Modelling techniques helped to predict the impact of HIV/AIDS on education supply and demand. The methodologies require the projection of the demographic impact as a first step and take into account the age and sex structure of the projected population. This type of methodology was developed by the United Nations Children's Fund and was widely used to estimate the supply of teachers and the number of school-age children who would not have teachers owing to HIV/AIDS.

A study of educator mortality in the KwaZulu Natal province of South Africa combined several methodologies, using an analysis of annual school survey data, a random sample survey of 100 schools and an examination of the mortality, pension and medical records of educators. Another study, in Botswana, Malawi and Uganda, used both qualitative and quantitative methods, including interviews with education managers, teachers, students and others; focus group discussions; and

an assessment of records on absenteeism, drop-outs and grade repetition from a sample of 41 schools in the three countries.

Several studies used data from the Demographic and Health Surveys (DHS) in many countries to identify orphans in the samples and to compare their educational attainment with that of non-orphans. DHS data are particularly useful for cross-national comparisons because their research design and questionnaires are similar. The Multiple Indicator Cluster Surveys sponsored by UNICEF also provide comparable information on education for a large number of countries.

6. *Health*

In the health sector, the most common methodologies used in the studies cited were the examination of hospital records and the collection of data from ministries of health as well as household surveys. The studies in the sector focused on health expenditures related to HIV/AIDS, including public and private expenses; allocation of funds to treatment and prevention; and sources of donor funding. In several cases, workshops were organized to elicit expert opinion on costs and expenditures for treatment. In Côte d'Ivoire, for example, physicians, leaders of non-governmental organizations, epidemiologists, health economists, a traditional practitioner and representatives of the National AIDS Control Programme met to discuss the costs of treatment for various types of patients.

One study of five developing countries used a combination of methodologies that collected objective and subjective information about AIDS expenditures. The countries were Brazil, Côte d'Ivoire, Mexico, Thailand and the United Republic of Tanzania. Sources of data for one or more of the five countries included financial reports of public expenditures or budgets; country workshops to estimate treatment costs; special health-sector analyses; a database of public hospital claims; and household surveys.

Household surveys were generally used to learn about private expenditures for the care and treatment of AIDS patients paid for by members of the family.

Although the supply of health workers is a major issue in the battle against HIV/AIDS, no studies were available that examined the impact of the epidemic on the health workforce.

7. *Economic growth*

All the studies of the impact of HIV/AIDS on economic growth used economic modelling techniques. In general, the task is to estimate how the economy would have performed in the absence of AIDS and contrast that result with an estimate of economic performance given the estimated or projected number of HIV/AIDS cases. The economic outcome studied is typically growth in total gross domestic product (GDP) per capita and/or growth in total GDP. Some studies employed cross-national data, either for a single time period or a time series. In those analyses, regression analysis was used to estimate the effects of one or more indicators of the volume of HIV/AIDS infections or deaths on economic outcomes, controlling for other variables that previous work had identified as having an important effect on economic growth. Other analysis employed an economic model fitted to the data of a particular country and, often, projected for 10 to 15 years in the future.

Some studies used a model that was further elaborated to posit a dual-sector economy, with a well-paying and productive formal sector and a low-wage, low-productivity informal sector. Other, more complex, variations of economic models were used to analyse how the impacts of HIV/AIDS on different sectors of an economy were related to the overall economic performance.

B. Need for further research on the impact of HIV/AIDS

An examination of studies that have been conducted so far reveals an urgent need for research that can shed more light on the effects of the HIV/AIDS epidemic. Where possible, longitudinal or follow-up studies with multiple rounds of interviews should be conducted to allow for ongoing examination of the cumulative effects of the epidemic. Larger and more representative samples of households and communities would

make findings more useful, as would studies in urban and peri-urban areas, which are currently underrepresented in AIDS research. An effort should be made to design research studies with control groups to make it easier to isolate the effect of AIDS. Qualitative research methods, such as focus groups, can bring a useful added dimension to quantitative studies.

Study design is of paramount importance when investigating an epidemic such as AIDS, since its impact may not be observable and quantifiable until it begins killing large numbers of people. Studies should at least acknowledge the lag time of the disease and the future effects, insofar as it is possible to incorporate them into the research design.

Although over the last two decades numerous studies on a wide variety of topics have been conducted on the effects of HIV/AIDS, enormous gaps in knowledge still exist. An important need in future studies of HIV/AIDS is the determination of the HIV status of individuals. In most of the studies reported on here, the actual cause of disease and death was not available, so it was often assumed that deaths were AIDS-related without having clinical evidence. Furthermore, testing for HIV is not common in many areas, and other ways of capturing HIV status should be explored.

More efforts should be made to understand what happens when families dissolve after an adult AIDS death—if and where they migrate, whether individually or as families. The fate of children orphaned by AIDS needs special attention, especially with regard to their nutritional status, educational achievement and long-term welfare.

In the case of firms and businesses, studies commissioned by the company concerned need to be shared with planners and policy makers so that the results can contribute to solutions.

In the health sector, documentation of care and treatment is often available from hospitals and clinics, but that approach may miss AIDS victims who do not have access to health-care facilities or who cannot afford treatment. More information is needed about the allocation of resources between prevention and treatment of HIV/AIDS and between HIV/AIDS and other diseases. Data are also lacking on the costs of care and treatment being borne by households and families on the one hand and by service providers on the other.

In the education sector, the effect of HIV/AIDS on the viability of school systems needs to be examined. The education sector competes for funds with other sectors, including the health sector, and the burgeoning demand for AIDS-related health care may squeeze education budgets and put all children at risk of receiving an inferior education.

In addition, more information needs to be analysed by gender. The death of a mother has very different implications for her young children than the death of the father. Gender data on orphans makes it possible to determine whether girls in families affected by HIV/AIDS are more disadvantaged than boys in terms of educational attainment and other indicators of well-being.

Finally, most of the available studies were carried out in sub-Saharan Africa. There are exceptions—for example, comparative studies of Demographic and Health Surveys and some studies in Thailand—but more research is needed in areas outside the African continent. The lack of such studies can be explained by the relatively low prevalence rates in countries in Asia and Latin America. However, studies in those regions are important for the insights they will provide on the spread and impact of AIDS under diverse socio-economic and cultural conditions.

The timely analysis and dissemination of the results of research is vitally important so that policy makers and programme officials can respond to the best available research. Improved knowledge and information about HIV/AIDS is an important step in conquering the epidemic, but conditions are changing so rapidly that failure to make studies available can render the results less valuable to planners.

II. DEMOGRAPHIC IMPACT OF AIDS

Since 1981, when the first cases of AIDS were diagnosed, the world has been facing the deadliest epidemic in modern history. Nearly 22 years after the start of the epidemic, mortality caused by AIDS has attained orders of magnitude comparable to those associated with other visitations of pestilence. In Europe alone, it is thought that over 20 million people died during the period 1347 to 1351 as a result of the Black Death. In contrast, the human immunodeficiency virus is a slow killer. However, the Joint United Nations Programme on HIV/AIDS (with the World Health Organization, 2002) estimated that by the end of 2002 42 million people were living with HIV/AIDS and that an additional 22 million people had already lost their lives to AIDS.

In spite of the progress made in treating people infected with HIV, in particular in the more developed countries, AIDS remains an incurable disease, and, coupled with malnutrition, it is a fatal disease. UNAIDS estimated that 29.4 million of the 42 million persons infected with HIV were living in sub-Saharan Africa, 6 million in South and South-east Asia and 2 million in Latin America and the Caribbean (UNAIDS and WHO, 2002).

Since people infected with HIV remain healthy for long periods before showing overt signs of immunodeficiency, the first stages of the HIV epidemic are difficult to detect. However, social scientists and epidemiologists modelling the impact of the epidemic have long known that its cumulative impact can be serious. In *World Population Prospects: The 2002 Revision* (United Nations, 2003d), the United Nations Department of Economic and Social Affairs Population Division incorporated the impact of AIDS into the estimates and projections of the populations of 53 countries. In most of those countries, HIV prevalence is estimated to be 2 per cent or more among the adult population aged 15-49. In addition, a few populous countries with lower prevalence levels were included owing to the large number of persons living with HIV (more than one million persons).

Table 1 presents the countries for which the demographic impact of AIDS is incorporated in the 2002 estimates and projections. Of the 53 countries, 38 are in Africa, five are in Asia, eight are in Latin America and the Caribbean and one each is in Europe and Northern America. Of the 37.1 million adults in the world infected by HIV by 2001, 34.6 million, or 93 per cent, resided in the 53 countries.

In most of the countries that are severely affected by the epidemic, HIV/AIDS is responsible for stopping or even reversing the long-term health and mortality improvements that had been registered until recently. The spread of HIV has thus compromised the first stage of the epidemiological transition in developing countries—that is, the passage from high to low mortality as infectious diseases are brought under control and are no longer the major cause of death (Omran, 1971; 1982). Indeed, with the emergence of HIV/AIDS, several countries of sub-Saharan Africa, which already lagged behind in the epidemiological transition, have experienced a major setback in terms of combating infectious disease and avoiding premature death. Furthermore, the interaction of HIV with other infectious agents exacerbates its detrimental impact on longevity. The increasing incidence and lethality of tuberculosis in a number of developing countries is one instance of such interaction. In rural Malawi the incidence of tuberculosis doubled between 1986 and 1994, largely because HIV-positive persons are seven times more likely to develop tuberculosis than those who are not infected by HIV (Glynn and others, 1997).

A. METHODOLOGY AND DATA

1. *Estimating and projecting the impact of HIV/AIDS*

Chapter II assesses the impact of the epidemic in countries that are severely affected by HIV/AIDS by comparing population estimates and projections based on realistic assumptions about the course of the epidemic with hypothetical

TABLE 1. COUNTRIES FOR WHICH THE DEMOGRAPHIC IMPACT OF HIV/AIDS IS EXPLICITLY INCLUDED IN THE 2002 REVISION OF THE OFFICIAL UNITED NATIONS ESTIMATES AND PROJECTIONS

	Country	*Prevalence in 2001 (adults 15-49)*
Africa		
1	Angola	5.5
2	Benin	3.6
3	Botswana	36.5
4	Burkina Faso	6.4
5	Burundi	8.3
6	Cameroon	11.8
7	Central African Republic	12.9
8	Chad	3.6
9	Congo	7.1
10	Côte d'Ivoire	9.6
11	Democratic Republic of the Congo	4.9
12	Djibouti	7.1
13	Equatorial Guinea	3.4
14	Eritrea	2.8
15	Ethiopia	6.5
16	Gabon	3.6
17	Gambia	1.6
18	Ghana	2.8
19	Guinea	1.8
20	Guinea-Bissau	2.8
21	Kenya	15.0
22	Lesotho	30.1
23	Liberia	6.5
24	Malawi	16.1
25	Mali	1.6
26	Mozambique	12.8
27	Namibia	22.2
28	Nigeria	5.8
29	Rwanda	9.1
30	Sierra Leone	6.7
31	South Africa	21.3
32	Sudan	2.6
33	Swaziland	33.7
34	Togo	6.0
35	Uganda	4.4
36	United Republic of Tanzania	7.8
37	Zambia	21.6
38	Zimbabwe	33.9

TABLE 1 *(continued)*

Country	*Prevalence in 2001 (adults 15-49)*
Asia	
1 Cambodia	2.7
2 China	0.1
3 India	0.8
4 Myanmar	2.0
5 Thailand	1.8
Latin America and the Caribbean	
1 Bahamas	3.5
2 Belize	2.1
3 Brazil	0.6
4 Dominican Republic	2.5
5 Guyana	2.7
6 Haiti	6.1
7 Honduras	1.6
8 Trinidad and Tobago	2.5
More developed regions	
1 Russian Federation	0.9
2 United States of America	0.8

Source: United Nations, Department of Economic and Social Affairs, Population Division, World population prospects: The 2002 Revision, highlights (ESA/P/WP.180, 2003).

estimates and projections that make no allowance for the existence of AIDS. The latter are derived from the application of the Population Division standard projection program on the basis of assumptions regarding the future course of mortality that are similar to and consistent with those made with respect to countries that are still largely free from the HIV/AIDS epidemic. The process to derive estimates and projections that explicitly incorporate the effect of HIV/AIDS is more complex and is made in several steps. The estimation process is carried out by the Joint United Nations Programme on HIV/AIDS; therefore, the results of the projections are consistent with the estimates produced by UNAIDS. The dynamics of the HIV/AIDS epidemic, as estimated by UNAIDS, are assumed to remain unchanged until 2010. Thereafter, prevalence levels are assumed to decline in a manner consistent with modifications of behaviour that reduce the rates of recruitment into high-risk groups and the chances of infection among those engaging in high-risk behaviour.

In many of the countries in table 1, the prevalence of HIV was still rising at the time of the most recent observation. In most such cases, the projections assume that HIV prevalence will peak sometime during the period 2002-2020. In about half of the 53 countries, the peak prevalence is estimated to have occurred already, between 1993 and 2001. However, in some of those cases the evidence remains weak that prevalence has indeed passed its peak. Only in Burundi, the Congo, Côte d'Ivoire, Uganda, the United Republic of Tanzania and Zambia is HIV prevalence estimated to have declined by 1.0 percentage points or more from the peak level reached, and only in Thailand and Uganda has prevalence declined by at least one quarter of its peak value. Even in those populations where prevention efforts have succeeded in

lowering HIV prevalence, HIV infection is projected to remain a serious risk for the foreseeable future.

Current estimates indicate that the AIDS epidemic has already had a major impact on mortality. In the seven countries with an adult HIV prevalence of 20 per cent and above, more than 20 years of life expectancy at birth have already been lost to the epidemic, and this effect is expected to intensify in the future. The following sections present in further detail the different facets of the demographic impact of HIV/AIDS.

2. *Characteristics of the HIV epidemic*

The HIV/AIDS epidemic is progressing rapidly and is affecting regions of the world unequally. As of the end of 2002, over 70 per cent of those infected were estimated to live in sub-Saharan Africa, and that region's share of the number of HIV infections worldwide was still growing. Within Africa, the most affected populations are found in Eastern and Southern Africa, in a broad band running southwards from Ethiopia, Kenya and Uganda to Namibia and South Africa. The seven countries with an adult HIV prevalence of 20 per cent or more belong to those regions and were home to 74 million inhabitants in 2000 (see table 2). The second group of countries exhibited an adult HIV prevalence of 10 to 20 per cent. Five countries, most of them in Middle Africa and Eastern Africa, belong to the second group, and their total population was 79 million people in 2000. The third group consists of 14 countries with prevalence rates from 5 to 10 per cent and a total population of 293 million people in 2000. The 17 countries in the fourth group had prevalence rates of 2 to 5 per cent and were home to 216 million people. The last group of 10 countries had an adult HIV prevalence rate below 2 per cent, with India's share representing 4 million of the 14 million adult infections in the group.

Within Africa, in the last 10 years, prevalence levels within Eastern and Southern Africa have changed dramatically. In Eastern Africa, which recorded the highest prevalence until 1993, the level appears to have stabilized or fallen in Uganda and parts of the United Republic of Tanzania. In contrast, adult HIV prevalence in Southern Africa has soared, overtaking Eastern Africa.

B. IMPACT OF AIDS

The demographic impact of AIDS has been assessed for each of the 53 countries listed in table 1 by considering such demographic variables as total population size, additional deaths caused by AIDS, the crude death rate, life expectancy at birth and infant and child mortality. Since 38 of the 53 countries considered are in Africa, the results are presented separately for those African countries as an aggregate. In addition, special attention is given to the seven countries where adult HIV is over 20 per cent, namely, Botswana, Lesotho, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. As the countries are classified by region—38 countries in Africa, 5 in Asia and 8 in Latin America—the demographic impact of AIDS will be examined for each of those regions. The five prevalence groups (see table 2) are also examined separately.

1. *Number of deaths*

Table 3 and annex tables A.1 and A.2 present the projected number of deaths from 1995-2000 to 2020-2025 by country grouping, taking into account the impact of the HIV/AIDS epidemic. Also shown is the projected number of deaths if there were no epidemic. The difference between those two numbers is the additional number of deaths due to AIDS. The annual number of excess deaths in the 53 countries reached one million in the early 1990s, 3 million by 2000, and more than 4 million by 2003. The death toll will become much higher in the years to come (figure 1). The impact of AIDS on the number of deaths reaches its peak in 2020-2025. In the absence of AIDS, the total number of deaths in the 38 African countries considered would be expected to increase from 39 million in 1995-2000 to 46 million in 2020-2025. With AIDS, the total number of deaths is expected to rise instead to 64 million in 2020-2025, implying that the epidemic would cause almost 19 million (or 41 per cent) additional deaths during the latter period. In total, about 355 million deaths are projected to occur between 1995 and 2025 in the 38 African countries considered, a number 98 mil-

TABLE 2. COUNTRIES GROUPED ACCORDING TO THE LEVEL OF ADULT HIV PREVALENCE IN 2001

20 per cent or more	*10 to 20 per cent*	*5 to 10 per cent*	*2 to 5 per cent*	*Less than 2 per cent*
1. Botswana	1. Cameroon	1. Angola	1. Bahamas	1. Brazil
2. Lesotho	2. Central African Republic	2. Burkina Faso	2. Belize	2. China
3. Namibia	3. Kenya	3. Burundi	3. Benin	3. Gambia
4. South Africa	4. Malawi	4. Congo	4. Cambodia	4. Guinea
5. Swaziland	5. Mozambique	5. Côte d'Ivoire	5. Chad	5. Honduras
6. Zambia		6. Djibouti	6. Dem. Rep. of the Congo	6. India
7. Zimbabwe		7. Ethiopia	7. Dominican Republic	7. Mali
		8. Haiti	8. Equatorial Guinea	8. Russian Federation
		9. Liberia	9. Eritrea	9. Thailand
		10. Nigeria	10. Gabon	10. United States of America
		11. Rwanda	11. Ghana	
		12. Sierra Leone	12. Guinea-Bissau	
		13. Togo	13. Guyana	
		14. United Rep. of Tanzania	14. Myanmar	
			15. Sudan	
			16. Trinidad and Tobago	
			17. Uganda	

Source: World *Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8*).*

TABLE 3. ESTIMATED AND PROJECTED IMPACT OF HIV/AIDS ON MORTALITY INDICATORS

Indicator	*All 53 countries*			*38 African countries*			*7 countries with prevalence of 20 per cent or more*		
	1995-2000	*2010-2015*	*2020-2025*	*1995-2000*	*2010-2015*	*2020-2025*	*1995-2000*	*2010-2015*	*2020-2025*
Number of deaths (millions)									
Without AIDS	159	174	193	39	44	46	3	3	4
With AIDS	170	207	231	48	63	64	5	10	9
Absolute difference	11	32	38	8	19	19	2	6	5
Percentage difference	7	19	20	21	43	41	71	193	142
Life expectancy at birth (years)									
Without AIDS	63.9	68.4	70.8	52.7	58.3	62.1	62.3	67.0	69.6
With AIDS	62.4	64.2	65.9	47.0	47.1	51.3	50.2	37.6	41.0
Absolute difference	1.5	4.1	4.9	5.7	11.3	10.8	12.0	29.4	28.6
Percentage difference	2.4	6.1	6.9	10.9	19.3	17.4	19.3	43.9	41.1
Crude death rate (per 1,000)									
Without AIDS	9.0	8.1	8.0	13.6	10.2	8.5	8.0	6.7	6.5
With AIDS	9.6	9.8	10.1	16.8	16.0	13.6	14.1	24.9	23.3
Absolute difference	0.7	1.7	2.0	3.1	5.8	5.2	6.1	18.2	16.8
Percentage difference	7.5	21.5	25.0	22.9	57.1	61.4	75.6	273.6	259.6
Infant mortality rate (per 1,000)									
Without AIDS	66.4	49.8	40.9	98.5	75.2	60.9	55.4	40.7	32.9
With AIDS	67.5	51.3	42.1	102.6	79.9	65.1	66.1	54.6	45.4
Absolute difference	1.1	1.4	1.3	4.1	4.7	4.2	10.7	13.9	12.5
Percentage difference	1.7	2.9	3.2	4.2	6.3	6.9	19.2	34.2	37.9
Child mortality rate (per 1,000)									
Without AIDS	93.9	68.9	56.1	157.6	116.6	91.7	80.2	56.9	44.8
With AIDS	98.8	75.8	62.3	172.4	134.5	107.5	108.8	100.2	84.3
Absolute difference	5.0	6.9	6.2	14.9	17.8	15.8	28.7	43.3	39.6
Percentage difference	5.3	10.0	11.1	9.4	15.3	17.3	35.7	76.2	88.4

Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

lion higher than would have been expected in the absence of AIDS. South Africa will account for the largest share of those deaths (15.9 million), followed by Nigeria (14.1 million), Kenya (8.9 million) and Ethiopia (8.1 million).

Figure 1 shows the projected toll of AIDS based on evidence about how the epidemic has been evolving so far. The reality may prove to be either better or worse. For future years, especially after 2010, the projected excess mortality due to AIDS increasingly represents the early death of persons who have not yet been infected. Whether the projection proves too optimistic or too pessimistic depends greatly on actions taken now to prevent the spread of the disease and improve the treatment of those who contract it.

In the seven countries where adult HIV prevalence is above 20 per cent, the additional number of deaths from AIDS will rise from 71 per cent in 1995-2000 to 204 per cent in 2005-2010. Overall, between 1995 and 2025, those seven countries will experience about 30 million (156 per cent) additional deaths. The proportional increase in the number of deaths due to AIDS is highest in Botswana, where the number of additional deaths from AIDS is expected to reach 223,000 in 2005-2010, more than four times the number of deaths without AIDS. In Zimbabwe, in that period, the number of deaths will be over 3 times as large as without AIDS, and in Swaziland and South Africa over twice as large.

Outside of Africa, AIDS will increase the number of deaths by more than 25 per cent in the Bahamas (43 per cent), Haiti (40 per cent) and Trinidad and Tobago (30 per cent). In terms of absolute numbers, India and China are expected to experience the highest numbers of additional deaths caused by AIDS: 31 million in India between 1995-2025 and 18 million in China during the same period.

2. *Life expectancy at birth and crude death rate*

Life expectancy at birth, a measure indicating the average number of years that a newborn child would live if mortality remained constant throughout his or her lifetime, is estimated for the country groupings considered. In the 38 African countries, life expectancy at birth is estimated at 47 years in 1995-2000, 5.7 years lower than it would have been in the absence of AIDS. Life expectancy is expected to decline in 2000-2005 before resuming an upward trend, but reaching only 51.3 years by 2020-2025. In the absence of AIDS, life expectancy at birth would reach 62.1 years in 2020-2025, 10.8 years higher than life expectancy with AIDS (table 3 and annex tables A.3 and A.4).

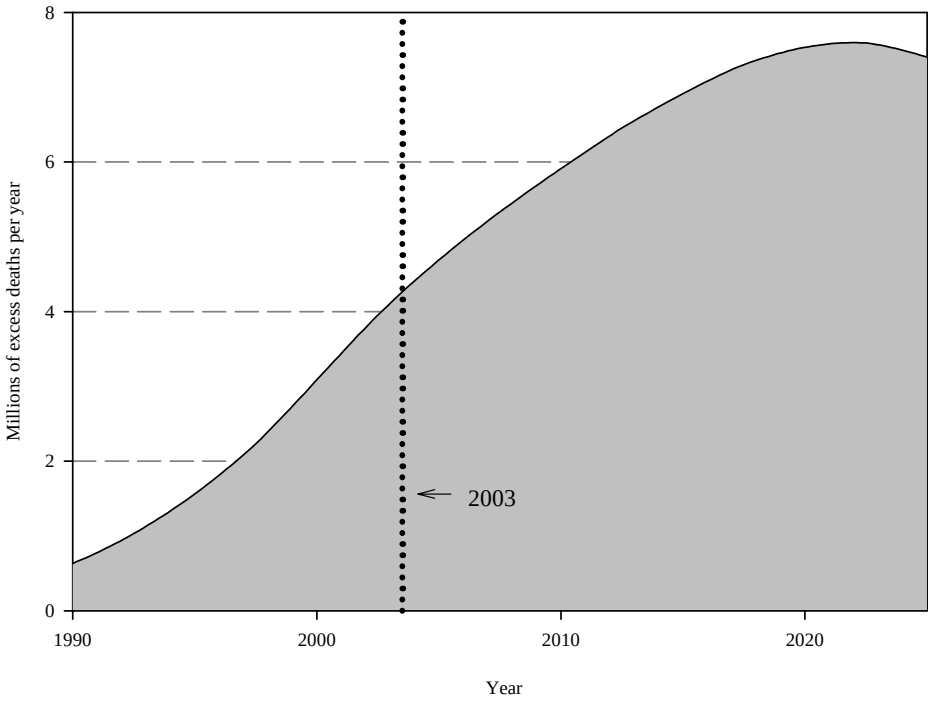
The effect of AIDS is more marked in the seven countries with adult HIV prevalence above 20 per cent. Life expectancy in those countries is estimated at 50.2 years in 1995-2000, about 12 years lower than it would have been in the absence of AIDS. By 2020-2025, the difference in life expectancy with and without AIDS is projected to reach 28.6 years.

Among the seven countries with the highest prevalence, Botswana, Namibia, Swaziland and Zimbabwe are affected the most. In Botswana, life expectancy at birth dropped from 65 years in 1990-1995 to 39.7 years in 2000-2005, a figure about 28 years lower than it would have been in the absence of AIDS. By 2010-2015, the loss of life expectancy at birth due to AIDS is expected to peak at 31.6 years. At that time, life expectancy at birth is expected to reach a low of 39 years.

In Namibia, life expectancy at birth dropped from 59.2 years in 1990-1995 to 44.3 years in 2000-2005. It is expected to drop further to 39.6 years in 2010-2015, 29 years less than the expected level in the absence of AIDS. In Zimbabwe, life expectancy was estimated at 53.3 years in 1990-1995 compared to 64.5 years in the absence of AIDS. It is projected to decrease to 31.2 years in 2005-2010. In the absence of AIDS, it would have been expected to rise to 69.1 years, a difference of nearly 38 years.

In South Africa, where the epidemic started later than in Zimbabwe, life expectancy at birth is also expected to decrease drastically. In 1990-1995, the average life expectancy was estimated at 61.8 years and had barely been affected by AIDS. By 2005-2010, life expectancy is projected to decrease to 41.5 years, 27 years lower than in the absence of AIDS. In other countries with high

Figure 1. Estimated and projected excess deaths due to AIDS in 53 countries, 1990-2025



Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8); see annex table A.1.

HIV prevalence, at least 20 years of life are expected to be lost to AIDS by 2020-2025: 32 years in Lesotho, 36 years in Swaziland and 23 years in Zambia.

Outside the African region, the Bahamas, Cambodia, the Dominican Republic, Haiti and Myanmar will also exhibit significant reductions in life expectancy. In the Bahamas, life expectancy at birth was estimated at 67.3 years in 1995-2000. By 2020-2025, it is expected to increase to 70.4 years, 8 years less than it would have been in the absence of AIDS. In Haiti, the loss of life expectancy from AIDS will reach 10 years by 2015-2020. In Cambodia, the Dominican Republic, Guyana, Myanmar and Trinidad and Tobago, at least 4 years of life expectancy at birth will be lost to the HIV/AIDS epidemic by 2015-2020.

HIV/AIDS is having effects on the crude death rate (the annual number of deaths per thousand population) similar to those on the life expectancy at birth (table 3 and annex tables A.5 and A.6). In some cases, death rates that were projected to decline in the absence of HIV/AIDS will instead rise. For instance, in the absence of AIDS, the crude death rate for the 38 African countries considered was expected to decline from 13.6 deaths per 1,000 persons in 1995-2000 to 8.5 deaths per 1,000 in 2020-2025. AIDS will cause the crude death rate to increase from 16.8 deaths per 1,000 in 1995-2000 to 17.5 deaths per 1,000 in 2000-2005 before declining to 13.6 deaths per 1,000 in 2020-2025. The ratio of the crude death rate according to the projections with AIDS and that yielded by the projections without AIDS will rise over time, and by 2020-2025 AIDS will be responsible for a 61.4 per cent increase in the crude death rate.

3. *Population size and growth*

Figure 2, table 4, and annex tables A.7 and A.8 present the projected population size from

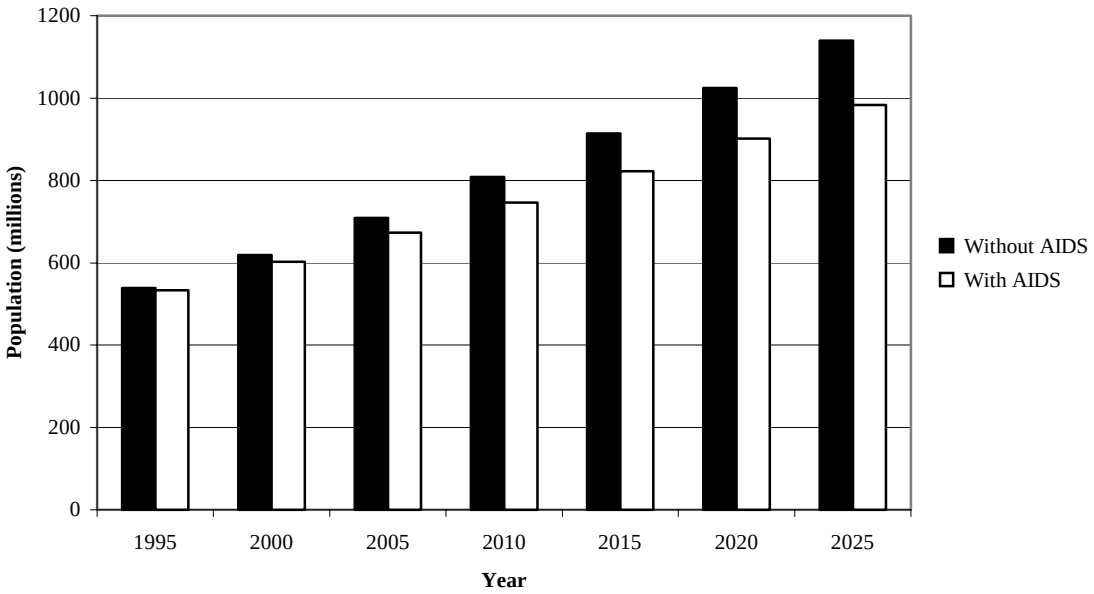
1995 to 2025, taking into account the demographic impact of AIDS as well as the hypothetical projected population in the absence of AIDS. The absolute difference between the projected population with and without AIDS indicates the cumulative impact of AIDS. For the 53 countries considered, the population is estimated at 3.4 billion as of mid-1995, about 9 million fewer than it would have been in the absence of AIDS. The proportional impact of AIDS on population size is more marked in Africa. In the 38 most affected African countries, the population size is estimated at 533 million in 1995, 6 million less than it would have been in the absence of AIDS. By 2025, the population of these 38 African countries will reach 983 million, that is, 156 million (or 14 per cent) fewer than in the absence of AIDS.

The impact of AIDS on population size is even more striking in the seven countries with an adult prevalence of 20 per cent or more (figure 3, table 4 and annex table A.8). In 1995, their population stood at 68 million, 1 per cent less than it would have been without AIDS. Since the impact of the epidemic is projected to increase, the difference between the projected population with and without AIDS rises, in relative terms, to 10 per cent in 2005 and 35 per cent in 2025.

The impact of AIDS on the population size of the countries with prevalence rates of 10 to 20 per cent is also projected to be severe. By 2025, their population is projected to be 21 per cent lower than in the absence of AIDS. In the countries where adult HIV prevalence ranges between 5 and 10 per cent, 11 per cent fewer people are projected in 2025 than in the absence of the HIV/AIDS epidemic, and in the group of countries with prevalence rates below 2 per cent, the population size is projected to be 2 per cent lower in 2025 than it would have been in the absence of AIDS.

At the country level, by 2025, the populations of Botswana, Lesotho and Zimbabwe are expected to be more than 40 per cent lower than they would have been in the absence of AIDS. In some countries, including Botswana, Lesotho and South Africa, the population size is expected to start declining after 2005.

Figure 2. Estimated and projected population size with and without AIDS, 38 African countries, 1995-2000 to 2020-2025



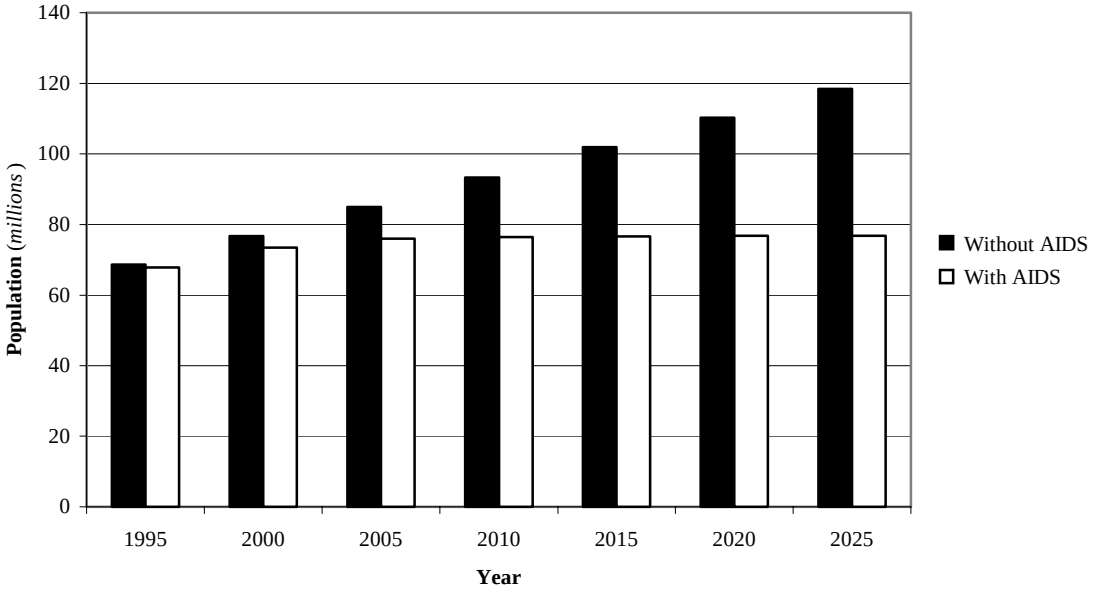
Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE 4. ESTIMATED AND PROJECTED EFFECTS OF HIV/AIDS ON POPULATION SIZE AND POPULATION GROWTH

Country grouping	Population size (millions)			Annual population growth (percentage)	
	1995	*2015*	*2025*	*1995-2015*	*2015-2025*
All 53 countries					
Without AIDS	3 408	4 440	4 921	1.3	1.0
With AIDS	3 399	4 312	4 687	1.2	0.8
Absolute difference	9	129	235	0.1	0.2
Percentage difference	0	3	5		
38 African countries					
Without AIDS	539	914	1 139	2.6	2.2
With AIDS	533	823	983	2.2	1.8
Absolute difference	6	91	156	0.5	0.4
Percentage difference	1	10	14		
7 countries with prevalence of 20 per cent or more					
Without AIDS	69	102	118	2.0	1.5
With AIDS	68	77	77	0.6	0.0
Absolute difference	1	25	42	1.4	1.5
Percentage difference	1	25	35		

Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

Figure 3. Estimated and projected population size with and without AIDS in the 7 countries with the highest adult HIV prevalence, 1995-2025



Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

Outside of Africa, since adult HIV prevalence is generally lower, the impact of AIDS on population size is expected to be more moderate in relative terms. By 2025, the populations of Cambodia and Myanmar will be 4 to 5 per cent smaller than they would have been without AIDS, and Thailand's population will be 3 per cent lower. The population of India is expected to be 3 per cent smaller than it would have been in the absence of AIDS (27 million fewer people). The largest effect will be in Haiti, where the 2025 population is expected to be 14 per cent lower than it would have been without AIDS. Owing to their large populations, Brazil and India will experience a considerable shortfall in absolute terms, with their 2025 populations being 2.7 million and 27.2 million less respectively than would be expected without the effect of AIDS.

The adult population of working age has been more affected than younger or older populations. The young adult years are the most productive for income generation and family caregiving, so the loss of the people in this group to AIDS has far-reaching implications for households, the labour force, food production and the well-being of society. Figure 4 displays the age pyramid of Botswana in 2000 and as projected for 2025, with and without AIDS. In 2000, the impact of AIDS on the age structure of Botswana's population is still mild. But by 2025, more than half of the potential population aged 35-59 would have been lost to AIDS. In comparison, one third of the population aged less than 15 years old is expected to be lost to AIDS. The impact of AIDS on adult females is also expected to be higher owing to the higher adult HIV prevalence among women 15-49 years old.

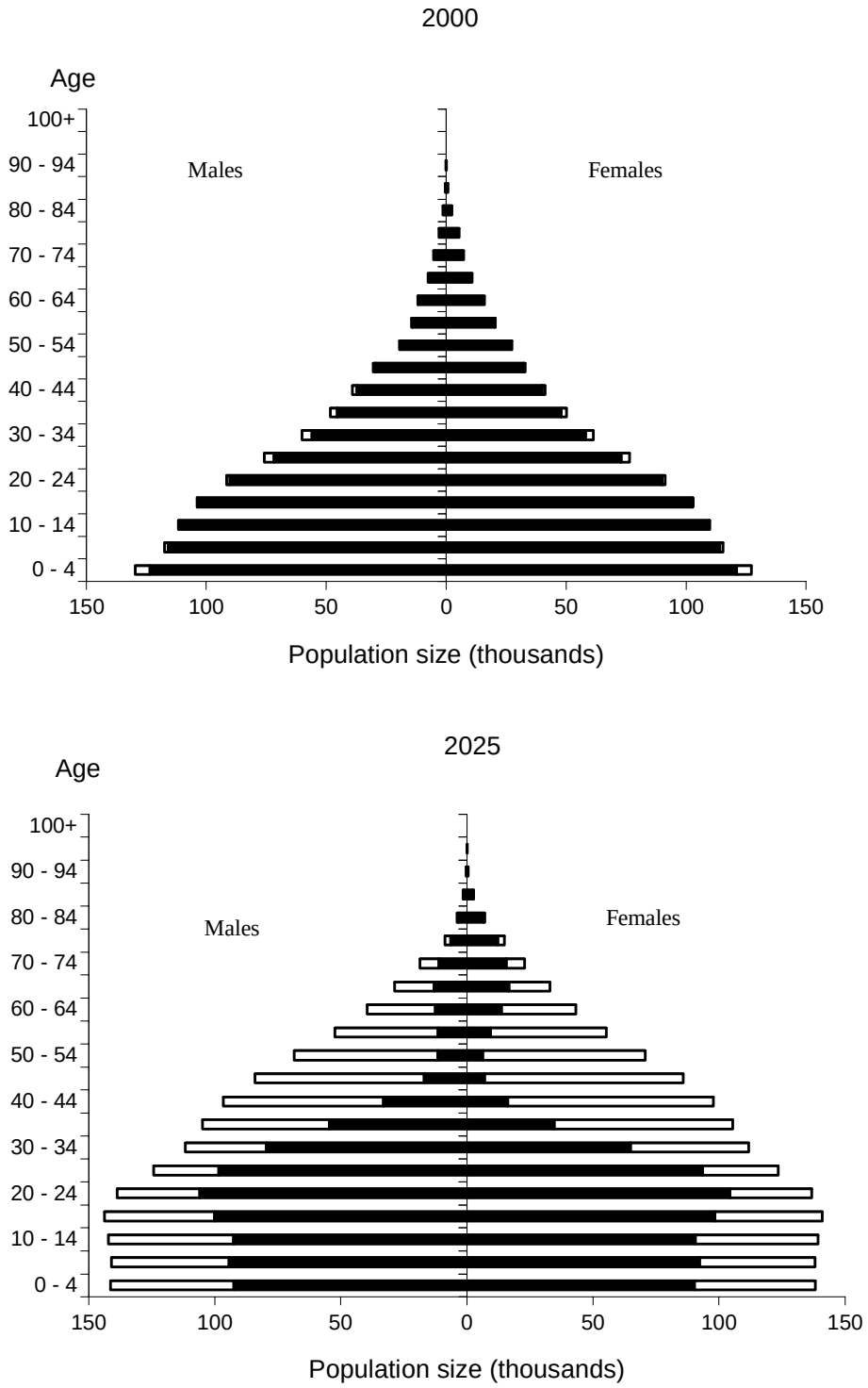
Partly as a result of the increase in mortality brought about by the HIV/AIDS epidemic, the rate of population growth has declined and will continue to do so in the countries affected. In the five most affected countries, the annual growth rate is expected to become negative in the near future. Figure 5 shows that in the 38 African countries considered, annual population growth will be significantly lower than it would have been in the absence of the AIDS epidemic. In the seven most affected countries, the expected reduction of the growth rate is even larger (figure 6). In Botswana, Lesotho, South Africa, Swaziland and Zimbabwe, the annual growth rate is expected to become negative by 2015. In Botswana, the country with the highest HIV prevalence, the average annual growth rate dropped from 3.3 per cent in 1980-1985 to 2.1 per cent in 1995-2000 and will drop to -0.6 per cent between 2010 and 2025, implying a decline in population size during that period. In the absence of AIDS, Botswana's population would have been growing at 2.5 per cent per year in 2000-2005 and 1.5 per cent per year in 2020-2025 (figure 7). In Zimbabwe, the growth rate fell from 3.9 per cent in the early 1980s to 1.5 per cent per year in 1995-2000 and is expected to decline to -0.2 per cent by 2020. In the absence of AIDS, Zimbabwe's population would have been growing at a rate above 2 per cent through 2015.

4. *Infant and under-five mortality*

Approximately one fourth to one third of children born to HIV-positive women are likely to acquire the infection from their mothers. Pediatric HIV infection is expected to have a substantial impact on mortality during infancy and childhood, particularly among older children (above age one). Table 3, and annex tables A.9 and A.10 present the infant and under-five mortality rates for groups of countries with and without AIDS. Even taking into account the impact of AIDS, infant mortality in the 38 African countries with moderate to high adult HIV prevalence is estimated to decline from 103 deaths per 1,000 live births in 1995-2000 to 65 deaths per 1,000 live births in 2020-2025, whereas under-five mortality is estimated to decline from 172 deaths per 1,000 live births to 108 deaths per 1,000 live births during the same period. In the absence of AIDS, the decline in both infant and under-five mortality rates would have been much steeper, from 99 deaths to 61 deaths per 1,000 live births and from 158 deaths to 92 deaths per 1,000 live births respectively.

In the seven African countries with the highest adult HIV prevalence, infant and under-five mortality are estimated at 66 deaths and 109 deaths respectively in the presence of AIDS in 1995-2000, but only 55 and 80 deaths per 1,000 live births in the absence of AIDS. In other words, AIDS has already produced an increase of more

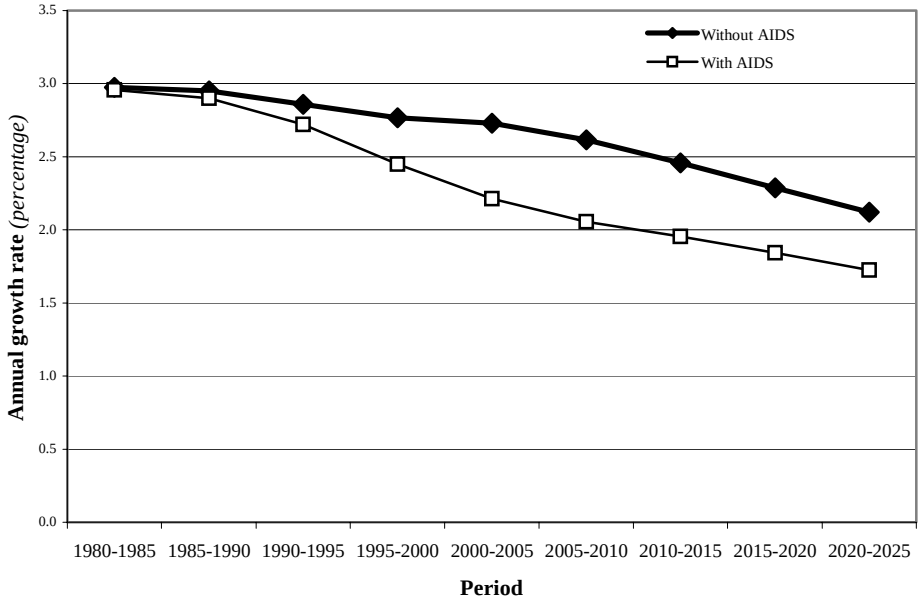
Figure 4. Population size with and without AIDS, Botswana, 2000 and 2025



Source: *World Population Prospects:The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

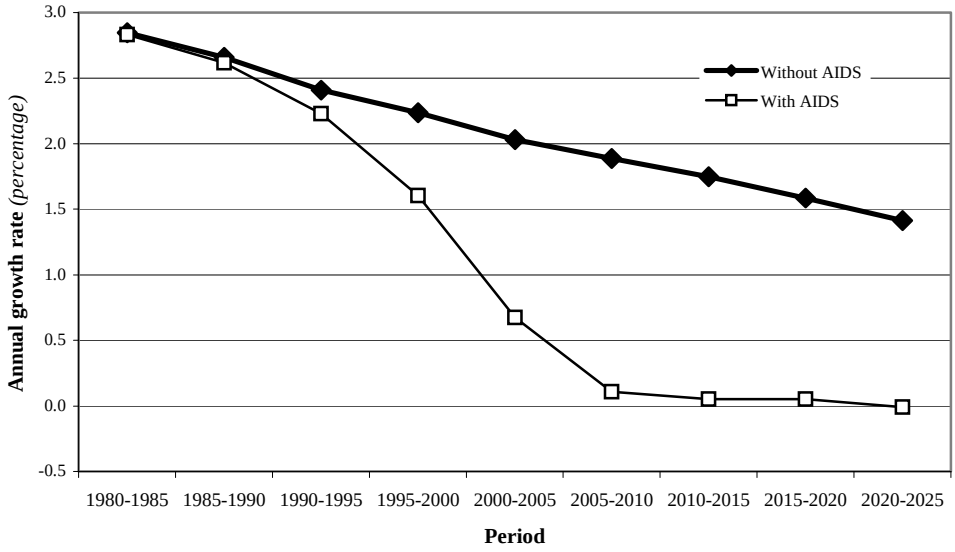
NOTE: Unshaded bars represent the hypothetical size of the population in the absence of AIDS. Shaded bars represent the actual estimated and projected population.

Figure 5. Annual growth rate with and without AIDS, 1980-1985 to 2020-2025, 38 African countries



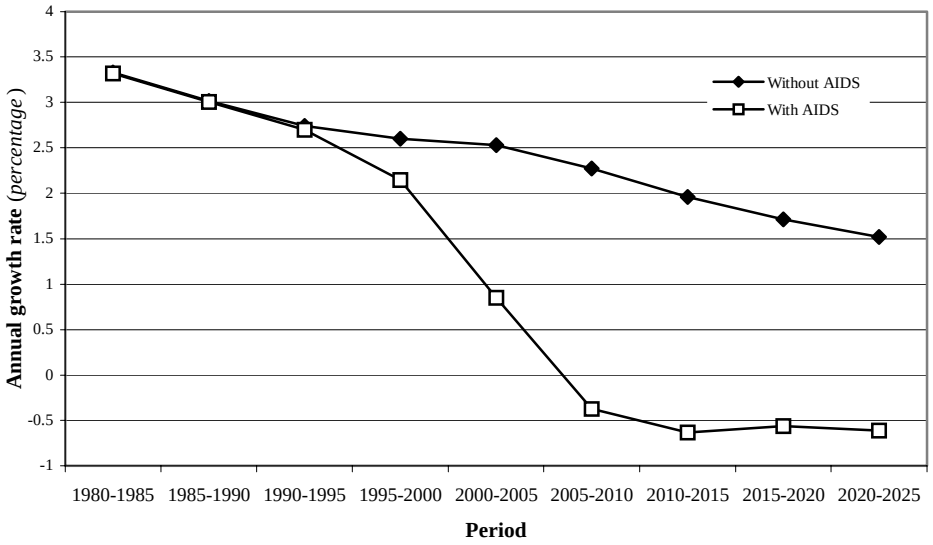
Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

Figure 6. Annual rate of growth with and without AIDS, 1980-1985 to 2020-2025 7 most affected countries



Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

Figure 7. Annual growth rate with and without AIDS, Botswana, 1980-1985 to 2020-2025



Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

than 19 per cent in infant mortality and of 36 per cent in under-five mortality. By 2020-2025, the increase in mortality caused by AIDS is expected to reach 38 per cent and 88 per cent, for infant and child mortality respectively. At the country level, in Botswana, under-five mortality is expected to reach 104 deaths per 1,000 live births by 2000-2005, whereas in the absence of AIDS it would have been expected to decrease to 45 deaths per 1,000. In Namibia, under-five mortality is projected at 107 per 1,000 in 2000-2005 instead of 67 per 1,000 in the absence of AIDS.

Outside Africa, the impact of AIDS on infant and under-five mortality is less than in African countries. By 2020-2025, the under-five mortality rate is expected to be 8 per cent higher in the presence of AIDS than in its absence in the five most affected Asian countries, whereas it is expected to be 9 per cent higher in the eight countries of Latin America and the Caribbean (annex table A.9).

As increasing numbers of young adults die of AIDS, they leave behind children without parents. The Joint United Nations Programme on HIV/AIDS defines AIDS orphans as children under the age of 15 who have lost one or both parents to AIDS. At the end of 2001, there were an estimated 14 million AIDS orphans worldwide, of whom 11 million lived in sub-Saharan Africa. In Nigeria, one million children were AIDS orphans, according to UNAIDS estimates. Other countries with large numbers of AIDS orphans were Ethiopia (990,000), the Democratic Republic of the Congo (930,000), Kenya (890,000), Uganda (880,000) and the United Republic of Tanzania (810,000).

5. *Gender dimension of the HIV/AIDS epidemic*

In the hardest-hit countries of Africa, where more women than men are infected, the impact of AIDS on life expectancy is projected to be higher for women than for men. Table 5 presents the loss of life expectancy caused by AIDS and the percentage difference in life expectancy at birth by sex in the most affected countries. In Botswana, 27.5 years of male life expectancy will be lost to AIDS by 2000-2005, whereas 29.5 years of female life expectancy will be lost to the disease. By 2020-2025, these figures are expected to reach 34.3 years and 42.5 years, respectively. At that time, male life expectancy would be 48 per cent

TABLE 5. LOSS OF LIFE EXPECTANCY AT BIRTH DUE TO AIDS, BY SEX, IN THE 7 COUNTRIES WITH THE HIGHEST ADULT HIV PREVALENCE: 2000-2005, 2010-2015 AND 2020-2025

	Loss of life expectancy at birth due to AIDS (years)		*Percentage difference*	
Country	*Male*	*Female*	*Male*	*Female*
		2000-2005		
Botswana	27.5	29.1	41	42
Lesotho	25.1	22.8	44	38
Namibia	20.6	21.6	32	32
South Africa	17.9	19.7	28	28
Swaziland	26.6	29.1	44	45
Zambia	19.0	23.1	37	42
Zimbabwe	32.1	36.9	49	53
		2010-2015		
Botswana	35.6	42.3	52	58
Lesotho	29.3	32.3	48	50
Namibia	26.5	32.2	40	45
South Africa	24.7	32.2	37	44
Swaziland	32.8	38.9	51	57
Zambia	19.8	24.6	36	42
Zimbabwe	35.5	42.0	52	58
		2020-2025		
Botswana	34.3	42.5	48	57
Lesotho	29.3	34.6	45	51
Namibia	25.6	31.8	37	43
South Africa	23.3	31.1	34	42
Swaziland	32.9	39.7	49	56
Zambia	20.2	25.6	34	40
Zimbabwe	33.9	41.9	48	56

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

lower than it would have been without AIDS, whereas female life expectancy would be nearly 60 per cent lower than the expected level in the absence of AIDS. In other hardest-hit countries, the impact of AIDS on life expectancy is also higher for females. By 2020-2025, females in Namibia, South Africa, Swaziland and Zimbabwe will all have lost at least 6 years of life expectancy more than their male counterparts.

C. CONCLUSIONS

The present chapter documents the likely impact of HIV/AIDS in the 53 countries where adult HIV prevalence is already significant. The toll that the disease is having is already serious and is projected to worsen. By 2025, the population of the 38 most affected countries in Africa is expected to be at least 156 million lower than it

would have been in the absence of AIDS. Between 1995-2025, some 98 million additional deaths are expected to occur in those countries as a result of AIDS, and about 58 million children will not be born because of the early deaths of women of reproductive age.

The increase in mortality caused by AIDS has reached major proportions in several countries. In Botswana, Mozambique, South Africa, Zambia and Zimbabwe, life expectancy at birth has already plummeted, dropping within a decade to levels last recorded in the 1950s and early 1960s. Infant and child mortality is also projected to increase in the countries most affected by the HIV/AIDS epidemic. Taking Botswana, the country with the highest HIV/AIDS adult prevalence rate as an example, all indicators point to drastic demographic changes by 2025, as reflected in the distorted population pyramid shown in figure 4. The size of the population will be more than 40 per cent lower than it would have been without AIDS, and the growth rate will be negative, resulting in a declining population. The crude death rate will increase from 5.7 deaths per 1,000 population in 1995-2000 to 31.3 deaths in 2010-2015. Life expectancy at birth, which reached 65 years in 1990-1995, will fall to only 39 years in 2010-2015.

In assessing the impact of HIV/AIDS, it is important to bear in mind that, although the epidemic is already having a clearly devastating effect in a few countries, its precise magnitude is difficult to determine in the best of circumstances, as there is a general lack of information on the many factors that determine the ultimate impact of the disease. Considerable uncertainty still surrounds the distribution of the time of progression from HIV infection to AIDS and from AIDS to death. Small changes in the assumptions made regarding progression time have important effects on the ultimate impact of the epidemic on mortality. There is also controversy and uncertainty about the type of effect that HIV infection has on fertility. If fertility is considerably lower among HIV-positive women, available estimates of HIV prevalence may be downwardly biased (Gregson and Zaba, 1998). Yet another area of considerable uncertainty is the level of prevalence among men, since most data on seroprevalence surveillance are obtained from antenatal clinics serving pregnant women. Even with respect to women, data from antenatal clinic surveillance, which are the cornerstone of national estimates of HIV prevalence, need to be improved to permit a more solid estimation of HIV prevalence at the national level.

Despite the uncertainties surrounding any measure of the impact of HIV/AIDS, all available data reinforce the case for urgent action. The disease is already widespread in some countries and shows few signs of being controlled in others. The list of affected countries has been increasing consistently since 1990. According to the estimates and projections presented above, AIDS is expected to have major detrimental effects on the population dynamics of all countries affected, and its impact might turn out to be even worse than expected if effective measures to prevent the continued rapid spread of the disease are not taken. Government authorities, the international community and civil society urgently need to raise people's awareness of the seriousness of the HIV/AIDS epidemic and take necessary actions in order to prevent the epidemic from following the course that has been presented here.

ANNEX TABLES

TABLE A.1. ESTIMATED AND PROJECTED NUMBER OF DEATHS, BY COUNTRY GROUPING, 1995-2025
(*Millions*)

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*1995-2025*
All 53 countries							
Without AIDS	159	162	168	174	183	193	1 039
With AIDS	170	182	194	207	220	231	1 203
Absolute difference	11	20	27	32	37	38	164
Percentage difference	7	12	16	19	20	20	16
38 African countries							
Without AIDS	39	41	43	44	45	46	258
With AIDS	48	56	61	63	64	64	355
Absolute difference	8	15	18	19	19	19	98
Percentage difference	21	36	43	43	42	41	38
5 Asian countries							
Without AIDS	91	93	95	100	107	115	602
With AIDS	93	96	102	111	122	132	656
Absolute difference	2	3	6	11	15	17	55
Percentage difference	2	4	7	11	14	15	9
8 Latin American and Caribbean countries							
Without AIDS	6	7	7	8	8	9	46
With AIDS	7	8	8	8	9	10	50
Absolute difference	0	1	1	1	1	1	4
Percentage difference	7	10	10	10	9	8	9
2 developed countries							
Without AIDS	22	22	22	22	23	24	134
With AIDS	22	23	23	24	25	25	142
Absolute difference	1	1	1	2	2	2	8
Percentage difference	2	4	6	8	7	7	6

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.2. ESTIMATED AND PROJECTED NUMBER OF DEATHS, BY LEVEL OF ADULT HIV PREVALENCE, 1995-2025
(*Millions*)

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*	*1995-2025*
7 countries with prevalence of 20 per cent or more							
Without AIDS	3	3	3	3	3	4	19
With AIDS	5	8	10	10	9	9	50
Absolute difference	2	5	6	6	6	5	30
Percentage difference	71	155	204	193	167	142	156
5 countries with prevalence 10 to 20 per cent							
Without AIDS	5	5	5	5	5	5	31
With AIDS	6	8	9	9	9	9	51
Absolute difference	2	3	4	4	4	4	20
Percentage difference	32	58	73	75	77	76	66
14 countries with prevalence of 5 to 10 per cent							
Without AIDS	19	21	22	22	23	23	129
With AIDS	23	26	28	29	30	30	167
Absolute difference	3	5	7	7	7	8	38
Percentage difference	18	26	30	32	33	33	29
17 countries with prevalence of 2 to 5 per cent							
Without AIDS	15	14	15	15	16	16	91
With AIDS	16	16	17	18	19	19	105
Absolute difference	1	2	2	3	3	3	14
Percentage difference	9	15	15	17	17	17	15
10 countries with prevalence of less than 2 per cent							
Without AIDS	117	119	123	128	136	145	768
With AIDS	120	124	130	141	153	164	831
Absolute difference	3	5	8	12	17	18	62
Percentage difference	2	4	6	10	12	13	8

Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.3. ESTIMATED AND PROJECTED LIFE EXPECTANCY AT BIRTH, IN YEARS, BY COUNTRY GROUPING, 1995-2025

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
All 53 countries						
Without AIDS	63.9	65.5	67.0	68.4	69.6	70.8
With AIDS	62.4	62.9	63.5	64.2	65.0	65.9
Absolute difference	1.5	2.6	3.5	4.1	4.6	4.9
Percentage difference	2.4	4.0	5.2	6.1	6.7	6.9
38 African countries						
Without AIDS	52.7	54.8	56.4	58.3	60.2	62.1
With AIDS	47.0	45.3	45.3	47.1	49.1	51.3
Absolute difference	5.7	9.5	11.1	11.3	11.1	10.8
Percentage difference	10.9	17.3	19.7	19.3	18.4	17.4
5 Asian countries						
Without AIDS	66.1	67.9	69.6	71.0	72.2	73.4
With AIDS	65.7	67.2	68.3	68.9	69.4	70.2
Absolute difference	0.4	0.7	1.3	2.1	2.8	3.2
Percentage difference	0.7	1.1	1.8	2.9	3.9	4.4
8 Latin American and Caribbean countries						
Without AIDS	67.4	68.9	70.3	71.6	72.8	73.9
With AIDS	66.2	67.1	68.4	69.7	70.8	72.0
Absolute difference	1.3	1.7	1.9	1.9	1.9	1.9
Percentage difference	1.9	2.5	2.7	2.6	2.6	2.6
2 developed countries						
Without AIDS	72.8	74.1	75.4	76.6	77.6	78.4
With AIDS	72.2	73.2	73.8	74.4	75.3	76.1
Absolute difference	0.6	1.0	1.6	2.2	2.3	2.2
Percentage difference	0.8	1.3	2.1	2.9	3.0	2.9

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.4. ESTIMATED AND PROJECTED LIFE EXPECTANCY AT BIRTH, IN YEARS, BY LEVEL OF ADULT HIV PREVALENCE, 1995-2025

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
7 countries with prevalence of 20 per cent or more						
Without AIDS	63.9	65.5	67.0	68.4	69.6	70.8
With AIDS	62.4	62.9	63.5	64.2	65.0	65.9
Absolute difference	1.5	2.6	3.5	4.1	4.6	4.9
Percentage difference	2.4	4.0	5.2	6.1	6.7	6.9
5 countries with prevalence 10 to 20 per cent						
Without AIDS	52.7	54.8	56.4	58.3	60.2	62.1
With AIDS	47.0	45.3	45.3	47.1	49.1	51.3
Absolute difference	5.7	9.5	11.1	11.3	11.1	10.8
Percentage difference	10.9	17.3	19.7	19.3	18.4	17.4
14 countries with prevalence of 5 to 10 per cent						
Without AIDS	66.1	67.9	69.6	71.0	72.2	73.4
With AIDS	65.7	67.2	68.3	68.9	69.4	70.2
Absolute difference	0.4	0.7	1.3	2.1	2.8	3.2
Percentage difference	0.7	1.1	1.8	2.9	3.9	4.4
17 countries with prevalence of 2 to 5 per cent						
Without AIDS	67.4	68.9	70.3	71.6	72.8	73.9
With AIDS	66.2	67.1	68.4	69.7	70.8	72.0
Absolute difference	1.3	1.7	1.9	1.9	1.9	1.9
Percentage difference	1.9	2.5	2.7	2.6	2.6	2.6
10 countries with prevalence of less than 2 per cent						
Without AIDS	72.8	74.1	75.4	76.6	77.6	78.4
With AIDS	72.2	73.2	73.8	74.4	75.3	76.1
Absolute difference	0.6	1.0	1.6	2.2	2.3	2.2
Percentage difference	0.8	1.3	2.1	2.9	3.0	2.9

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.5. ESTIMATED AND PROJECTED CRUDE DEATH RATE, BY COUNTRY GROUPING, 1995-2025
(Per 1,000 persons)

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
All 53 countries						
Without AIDS	9.0	8.5	8.3	8.1	8.0	8.0
With AIDS	9.6	9.7	9.7	9.8	10.0	10.1
Absolute difference	0.7	1.1	1.5	1.7	1.9	2.0
Percentage difference	7.5	13.2	17.8	21.5	24.1	25.0
38 African countries						
Without AIDS	13.6	12.3	11.3	10.2	9.2	8.5
With AIDS	16.8	17.5	17.2	16.0	14.8	13.6
Absolute difference	3.1	5.1	5.9	5.8	5.5	5.2
Percentage difference	22.9	41.8	52.6	57.1	60.0	61.4
5 Asian countries						
Without AIDS	7.8	7.4	7.3	7.3	7.4	7.7
With AIDS	8.0	7.7	7.8	8.1	8.6	9.0
Absolute difference	0.2	0.3	0.5	0.9	1.2	1.3
Percentage difference	2.4	4.0	7.2	11.7	15.5	17.0
Without AIDS	6.8	6.7	6.6	6.7	6.9	7.1
With AIDS	7.3	7.4	7.4	7.5	7.6	7.9
Absolute difference	0.5	0.7	0.8	0.8	0.8	0.7
Percentage difference	7.8	10.9	11.6	11.5	11.3	10.4
2 developed countries						
Without AIDS	10.2	10.0	9.8	9.6	9.6	9.8
With AIDS	10.4	10.4	10.4	10.5	10.5	10.6
Absolute difference	0.3	0.4	0.6	0.8	0.9	0.8
Percentage difference	2.6	4.0	6.3	8.6	8.9	8.3

Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.6. ESTIMATED AND PROJECTED CRUDE DEATH RATE, BY LEVEL OF ADULT HIV PREVALENCE, 1995-2025
(Per 1,000 persons)

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
7 countries with prevalence of 20 per cent or more						
Without AIDS	8.0	7.5	7.0	6.7	6.5	6.5
With AIDS	14.1	20.7	25.0	24.9	24.0	23.3
Absolute difference	6.1	13.2	17.9	18.2	17.5	16.8
Percentage difference	75.6	175.4	255.3	273.6	269.4	259.6
5 countries with prevalence 10 to 20 per cent						
Without AIDS	12.4	11.8	10.6	9.5	8.6	7.9
With AIDS	16.8	19.6	20.1	19.1	18.2	17.3
Absolute difference	4.3	7.8	9.5	9.6	9.6	9.4
Percentage difference	34.9	66.7	89.9	101.4	112.5	119.4
14 countries with prevalence of 5 to 10 per cent						
Without AIDS	14.0	12.9	11.7	10.5	9.5	8.6
With AIDS	16.7	16.8	16.1	14.9	13.8	12.7
Absolute difference	2.7	3.9	4.4	4.4	4.3	4.2
Percentage difference	19.5	30.3	37.5	42.0	46.0	48.6
17 countries with prevalence of 2 to 5 per cent						
Without AIDS	14.1	12.1	11.3	10.3	9.5	8.8
With AIDS	15.7	14.3	13.5	12.6	11.8	10.9
Absolute difference	1.6	2.2	2.2	2.3	2.3	2.2
Percentage difference	11.0	18.1	19.5	22.5	24.3	25.0
10 countries with prevalence of less than 2 per cent						
Without AIDS	8.0	7.9	7.9	7.9	7.9	8.2
With AIDS	8.4	8.3	8.3	8.3	8.5	8.7
Absolute difference	0.4	0.4	0.4	0.5	0.5	0.6
Percentage difference	4.9	5.0	5.3	6.2	6.7	6.9

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.7. ESTIMATED AND PROJECTED POPULATION SIZE, WITH AND WITHOUT AIDS, BY COUNTRY GROUPING, 1995-2025
(*Millions*)

Country grouping	*1995*	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
All 53 countries							
Without AIDS	3 408	3 667	3 923	4 181	4 440	4 689	4 921
With AIDS	3 399	3 644	3 874	4 096	4 312	4 510	4 687
Absolute difference	9	23	49	84	129	180	235
Percentage difference	0	1	1	2	3	4	5
38 African countries							
Without AIDS	539	619	709	808	914	1 025	1 139
With AIDS	533	603	673	746	823	902	983
Absolute difference	6	16	36	62	91	123	156
Percentage difference	1	3	5	8	10	12	14
5 Asian countries							
Without AIDS	2 267	2 419	2 558	2 692	2 821	2 937	3 034
With AIDS	2 264	2 414	2 549	2 676	2 792	2 892	2 970
Absolute difference	2	5	9	16	29	45	65
Percentage difference	0	0	0	1	1	2	2
8 Latin American and Caribbean countries							
Without AIDS	184	198	212	225	237	247	257
With AIDS	184	197	210	222	233	243	251
Absolute difference	0	1	2	3	4	5	6
Percentage difference	0	0	1	1	2	2	2
2 developed countries							
Without AIDS	419	432	444	456	468	480	491
With AIDS	418	431	442	452	463	473	482
Absolute difference	1	1	2	3	5	7	9
Percentage difference	0	0	0	1	1	1	2

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.8. ESTIMATED AND PROJECTED POPULATION SIZE, WITH AND WITHOUT AIDS, BY LEVEL OF ADULT HIV PREVALENCE, 1995-2025
(*Millions*)

Country grouping	*1995*	*2000*	*2005*	*2010*	*2015*	*2020*	*2025*
7 countries with prevalence of 20 per cent or more							
Without AIDS	69	77	85	93	102	110	118
With AIDS	68	74	76	76	77	77	77
Absolute difference	1	3	9	17	25	33	42
Percentage difference	1	4	10	18	25	30	35
5 countries with prevalence 10 to 20 per cent							
Without AIDS	71	81	92	103	115	127	139
With AIDS	70	79	85	92	98	104	110
Absolute difference	1	2	6	11	17	23	30
Percentage difference	1	3	7	11	15	18	21
14 countries with prevalence of 5 to 10 per cent							
Without AIDS	258	300	346	395	448	504	560
With AIDS	256	293	331	371	413	455	498
Absolute difference	2	7	14	24	36	48	62
Percentage difference	1	2	4	6	8	10	11
17 countries with prevalence of 2 to 5 per cent							
Without AIDS	196	220	249	282	316	352	391
With AIDS	194	216	242	270	300	331	364
Absolute difference	2	4	8	11	16	21	27
Percentage difference	1	2	3	4	5	6	7
10 countries with prevalence of less than 2 per cent							
Without AIDS	2 815	2 990	3 151	3 307	3 459	3 596	3 713
With AIDS	2 812	2 983	3 139	3 287	3 424	3 543	3 639
Absolute difference	3	6	12	20	34	53	74
Percentage difference	0	0	0	1	1	1	2

Source: World Population Prospects: The 2002 Revision, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.9. ESTIMATED AND PROJECTED INFANT AND UNDER-FIVE MORTALITY RATE, BY COUNTRY GROUPING, 1995-2025

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
			Infant mortality (per thousand)			
All 53 countries						
Without AIDS	66.4	60.7	55.4	49.8	45.3	40.9
With AIDS	67.5	62.0	56.7	51.3	46.7	42.1
Absolute difference	1.1	1.3	1.4	1.4	1.4	1.3
Percentage difference	1.7	2.2	2.5	2.9	3.1	3.2
38 African countries						
Without AIDS	98.5	89.5	82.8	75.2	67.9	60.9
With AIDS	102.6	94.3	87.6	79.9	72.5	65.1
Absolute difference	4.1	4.8	4.8	4.7	4.6	4.2
Percentage difference	4.2	5.3	5.8	6.3	6.7	6.9
5 Asian countries						
Without AIDS	59.0	52.5	46.2	40.4	36.2	32.1
With AIDS	59.1	52.8	46.6	41.1	36.9	32.8
Absolute difference	0.1	0.3	0.5	0.7	0.7	0.7
Percentage difference	0.2	0.5	1.1	1.6	2.1	2.3
8 Latin American and Caribbean countries						
Without AIDS	43.1	38.8	34.4	30.4	26.4	22.9
With AIDS	43.5	39.3	34.9	30.9	26.9	23.3
Absolute difference	0.5	0.5	0.5	0.5	0.5	0.4
Percentage difference	1.1	1.3	1.5	1.8	1.9	1.9
2 developed countries						
Without AIDS	9.5	8.6	7.9	7.3	6.7	6.2
With AIDS	9.5	8.8	8.2	7.6	7.0	6.6
Absolute difference	0.1	0.2	0.3	0.4	0.4	0.4
Percentage difference	0.8	2.2	4.0	5.0	5.7	6.4
			Under-five mortality (per thousand)			
All 53 countries						
Without AIDS	93.9	85.2	77.1	68.9	62.6	56.1
With AIDS	98.8	91.8	83.8	75.8	69.1	62.3
Absolute difference	5.0	6.6	6.7	6.9	6.5	6.2
Percentage difference	5.3	7.8	8.7	10.0	10.4	11.1
38 African countries						
Without AIDS	157.6	142.0	130.1	116.6	103.9	91.7
With AIDS	172.4	161.1	148.1	134.5	121.0	107.5
Absolute difference	14.9	19.2	18.0	17.8	17.1	15.8
Percentage difference	9.4	13.5	13.8	15.3	16.5	17.3

TABLE A.9 *(continued)*

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
5 Asian countries						
Without AIDS	75.3	65.3	56.0	48.2	43.6	38.4
With AIDS	76.8	67.3	58.8	51.5	46.4	41.3
Absolute difference	1.5	2.0	2.8	3.2	2.8	2.9
Percentage difference	2.0	3.1	5.0	6.7	6.3	7.5
8 Latin American and Caribbean countries						
Without AIDS	52.3	47.0	41.7	36.9	32.3	28.1
With AIDS	55.2	49.9	44.7	39.8	35.0	30.6
Absolute difference	2.9	2.9	2.9	2.9	2.8	2.5
Percentage difference	5.5	6.1	7.0	7.8	8.5	8.8
2 developed countries						
Without AIDS	11.7	10.7	9.9	9.1	8.4	7.8
With AIDS	12.0	11.4	11.2	10.5	9.4	8.8
Absolute difference	0.3	0.7	1.2	1.4	1.1	1.1
Percentage difference	2.4	7.0	12.4	15.0	12.7	13.5

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

TABLE A.10. ESTIMATED AND PROJECTED INFANT AND UNDER-FIVE MORTALITY RATE, BY LEVEL OF ADULT HIV PREVALENCE, 1995-2025

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
			Infant mortality (per thousand)			
7 countries with prevalence of 20 per cent or more						
Without AIDS	55.4	50.9	45.5	40.7	36.6	32.9
With AIDS	66.1	64.7	59.5	54.6	50.0	45.4
Absolute difference	10.7	13.8	14.0	13.9	13.4	12.5
Percentage difference	19.2	27.2	30.8	34.2	36.7	37.9
5 countries with prevalence 10 to 20 per cent						
Without AIDS	91.9	87.9	79.9	72.0	64.2	57.1
With AIDS	98.5	95.7	87.6	79.8	72.1	64.5
Absolute difference	6.6	7.8	7.8	7.9	7.8	7.4
Percentage difference	7.2	8.9	9.7	11.0	12.2	13.0
14 countries with prevalence of 5 to 10 per cent						
Without AIDS	98.0	91.5	84.3	76.2	68.6	61.3
With AIDS	101.5	95.5	88.2	80.1	72.4	64.7
Absolute difference	3.5	3.9	3.9	3.9	3.7	3.5
Percentage difference	3.6	4.3	4.6	5.1	5.5	5.7
17 countries with prevalence of 2 to 5 per cent						
Without AIDS	105.9	90.3	84.2	76.8	69.6	62.6
With AIDS	107.5	92.0	85.9	78.5	71.2	64.0
Absolute difference	1.5	1.7	1.7	1.7	1.6	1.5
Percentage difference	1.4	1.9	2.0	2.2	2.3	2.3
10 countries with prevalence of less than 2 per cent						
Without AIDS	53.4	47.5	41.8	36.8	32.9	29.2
With AIDS	53.5	47.7	42.3	37.3	33.6	29.9
Absolute difference	0.1	0.2	0.4	0.6	0.6	0.6
Percentage difference	0.3	0.5	1.0	1.6	2.0	2.2
			Under-five mortality (per thousand)			
7 countries with prevalence of 20 per cent or more						
Without AIDS	80.2	73.0	64.5	56.9	50.5	44.8
With AIDS	108.8	114.2	108.0	100.2	92.7	84.3
Absolute difference	28.7	41.2	43.5	43.3	42.2	39.6
Percentage difference	35.7	56.4	67.5	76.2	83.6	88.4
5 countries with prevalence 10 to 20 per cent						
Without AIDS	145.8	138.5	124.1	110.0	96.2	83.8
With AIDS	166.2	162.7	150.0	136.1	122.4	108.7
Absolute difference	20.4	24.2	25.8	26.1	26.2	24.9
Percentage difference	14.0	17.5	20.8	23.7	27.2	29.8

TABLE A.10 *(continued)*

Country grouping	*1995-2000*	*2000-2005*	*2005-2010*	*2010-2015*	*2015-2020*	*2020-2025*
14 countries with prevalence of 5 to 10 per cent						
Without AIDS	157.4	145.7	132.9	118.8	105.4	92.6
With AIDS	172.7	161.5	148.5	134.3	120.4	106.7
Absolute difference	15.3	15.9	15.7	15.6	15.0	14.0
Percentage difference	9.7	10.9	11.8	13.1	14.2	15.1
17 countries with prevalence of 2 to 5 per cent						
Without AIDS	170.2	143.7	132.9	119.8	107.1	95.0
With AIDS	175.6	157.2	142.8	129.7	116.6	103.7
Absolute difference	5.5	13.5	9.8	9.9	9.5	8.7
Percentage difference	3.2	9.4	7.4	8.3	8.8	9.2
10 countries with prevalence of less than 2 per cent						
Without AIDS	67.8	58.9	50.8	44.0	39.9	35.3
With AIDS	69.3	60.8	53.4	47.0	42.5	37.9
Absolute difference	1.5	1.9	2.6	3.0	2.5	2.6
Percentage difference	2.2	3.3	5.1	6.8	6.4	7.4

Source: *World Population Prospects: The 2002 Revision*, CD-ROM (United Nations, Department of Economic and Social Affairs, Population Division publication, Sales No. E.03.XIII.8).

III. IMPACT ON HOUSEHOLDS

The HIV/AIDS epidemic threatens the social fabric of the most affected countries. Of all units affected by the HIV/AIDS epidemic, individuals, households and families are the most affected. The evidence shows that the AIDS epidemic is having severe effects on households.

Many small-scale studies have documented those impacts. The first studies were conducted in Rakai, Uganda, one of the epicentres of the HIV epidemic in the 1980s. The present chapter presents a conceptual framework of the ways AIDS affects households and families and then reviews the available evidence regarding the economic and social impacts.

A. CONCEPTUAL FRAMEWORK FOR THE IMPACT OF HIV/AIDS ON HOUSEHOLDS

The household impact begins as soon as a member of a household starts suffering from HIV-related diseases. In addition to social and psychological consequences, three kinds of economic impacts can be distinguished. The first is the loss of the income of the family member, in particular if he or she is the breadwinner. The second impact is the increase in household expenditures to cover the medical costs. The third impact is the indirect cost resulting from the absenteeism of members of the family from work or school to care for the AIDS patient.

Figure 8 diagrams the processes through which the HIV-related illnesses or the AIDS death of one of its members affects the household economically and socially:

- The illness of a family breadwinner may result in his or her absence from work. The absenteeism may result in the loss of income. When the person dies, the temporary loss of income becomes a permanent loss.

- The medical costs to care for AIDS-related illnesses may increase. The household may exhaust its savings or sell its assets to cover the medical costs, resulting in a lower level of production and consumption. This could lead to a reduction in the nutritional intake of children and cause them to become malnourished.

- If a household member dies from the disease, the funeral, mourning and other costs may also add to the burden of the household. Mounting expenditures and loss of income of the AIDS patient may result in the impoverishment of the household.

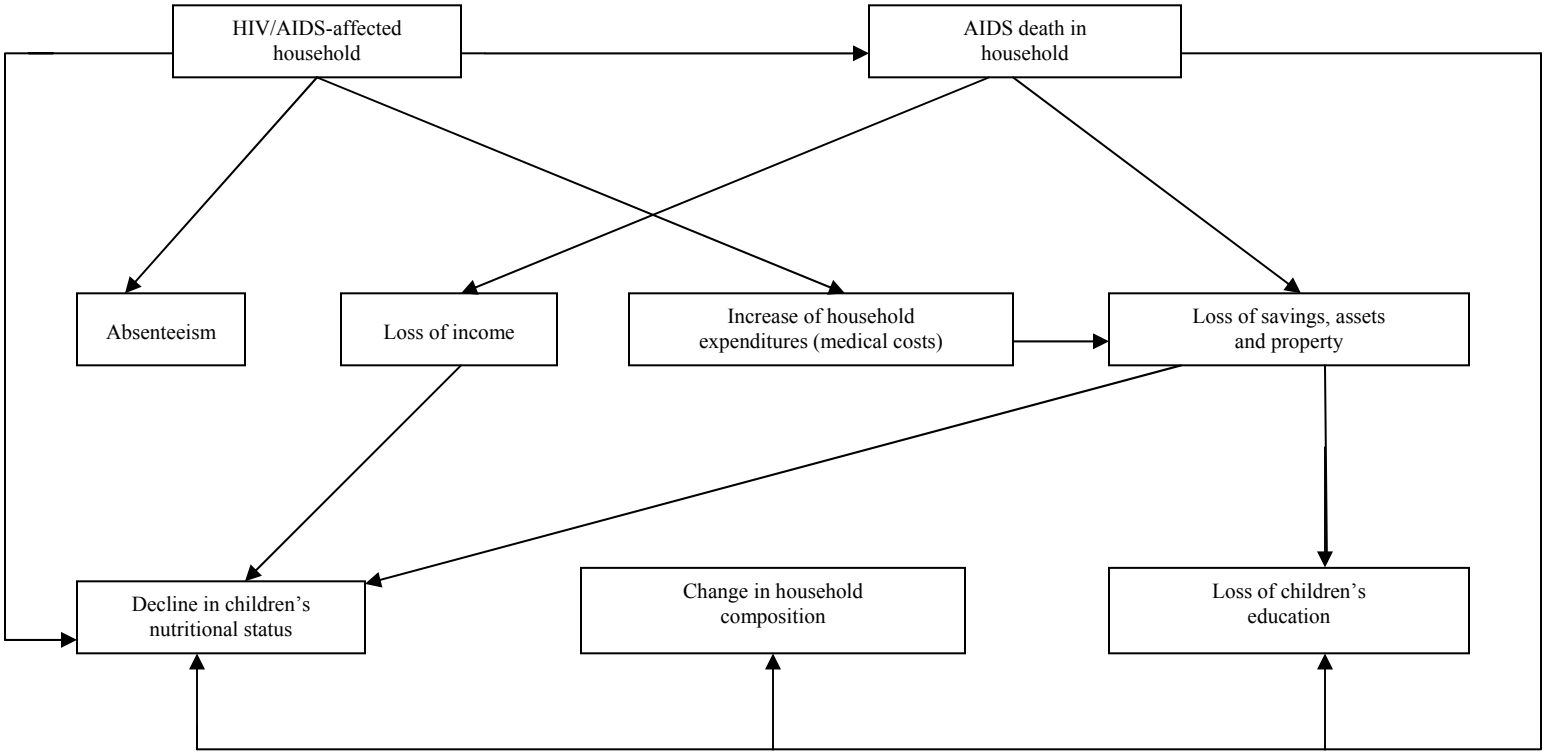
- Poorer households may be more severely affected than better-off households. The relationship between poverty and the costs of AIDS to households can be visualized at two levels. First, AIDS can push households into poverty. Second, a household that was already poor may become further impoverished.

In addition to the economic impact that the HIV/AIDS epidemic may have on households and families, it may have social implications as well. The household is the first unit of socialization, and it may go through tremendous changes.

- The HIV/AIDS epidemic may lead to a change in household composition, with the gradual disappearance of the parental generation and children being cared for by grandparents and other relatives. In some cases, the older children may act as surrogate parents for their younger siblings, thus leading to an increase in one-generation households headed by the older children.

- An adult death may lead to the dislocation or dissolution of the household, and children may be sent to live with relatives. Some of the children may withdraw from school if the family can no longer afford

Figure 8. Conceptual framework for the socio-economic impact of the HIV/AIDS epidemic on households



Source: United Nations, Department of Economic and Social Affairs, Population Division.

to pay fees or buy supplies. Children may also drop out of school if they are needed at home, on the farm or in the marketplace.

- The number of impoverished female-headed households will increase when the male breadwinner of the household dies of AIDS. When the AIDS victim in the household is female, the impact of the HIV/AIDS epidemic on the household can be especially severe, especially for the welfare of children. In addition, the culturally determined position of women can affect the household impact of an illness such as AIDS in males.

- Community attitudes towards helping needy households will contribute either positively or negatively to the impact of the disease. Thus, in communities where social and financial support is available, HIV/AIDS-affected households may be able to cope more effectively with the epidemic than those in communities where a stigma is attached to those infected with the virus.

B. Empirical evidence of the social and economic impact of the HIV/AIDS epidemic on households

1. *Treatment and other direct costs*

For households, perhaps the most direct costs of HIV/AIDS, and those that are usually measured by cost-of-illness studies, are the cost of treatment and the cost of lost work time, although there are also substantial secondary costs such as funeral expenses.

AIDS-affected households often make a rapid transition from relative wealth to relative poverty. Haworth and others' (1991) survey of AIDS-affected families in Zambia found that the shift into poverty was most visible in families in which the deceased father was both the breadwinner and tenant of a house provided through his job. Many such families were forced to move after the death of the father, with a majority of those families reporting economic difficulties.

In the early 1990s, the International Children's Centre in Paris launched a multi-country field study of the socio-economic evolution of children and families affected by HIV/AIDS in three countries: Burundi, Côte d'Ivoire and Haiti. In each of the countries, about 100 households affected by HIV/AIDS were followed longitudinally for a year. In Côte d'Ivoire, the study showed that marked differences occurred in the economic activities of households, with a steady decline in the number of economically active household members throughout the course of the study (Béchu, 1997). In Haiti, the changes included an overall reduction in the number of household dependents, the cessation of paid employment, increased borrowing and the sale of possessions as the disease became more serious. In addition, it was found that HIV/AIDS-affected persons were seeking less care even in circumstances when care was available.

In another longitudinal study, conducted in Rakai, Uganda, between 1989 and 1992, the proportion of households owning a car, lorry, radio or bicycle decreased in households that experienced an adult AIDS death, while households in which there were no adult deaths saw an increase in ownership of durable goods (table 6). The authors concluded that HIV-related adult illness and burial costs imposed great financial burdens on households, leading to a depletion of economic resources (Menon and others, 1998).

Recently, Booysen (2003) found similar results in South Africa. Households that had experienced illness or death in the recent past were more than twice as likely to be poor than non-affected households, and they were more likely to experience long-term poverty.

In a study in Delhi, India (Basu, Gupta and Krishna, 1997), the larger extended family or kin group provided the main cushion for absorbing a crisis such as an AIDS-related illness or death. Poor households bore proportionately more of the costs. The most common response to loss of income caused by an illness or death was to seek

TABLE 6. CHARACTERISTICS OF HOUSEHOLDS WITH AND WITHOUT AN ADULT (15-49 YEARS) DEATH DURING THE PANEL STUDY IN RAKAI, UGANDA 1989-1992

Characteristics	*Households without an adult death*	*Households with an adult death*	*All households*
Car/lorry			
First visit	1.1	1.6	1.1
Last visit	1.3	0.0	1.1
Bicycle			
First visit	33.9	38.6	34.4
Last visit	41.0	34.8	40.3
Radio			
First visit	29.7	39.7	30.8
Last visit	37.0	35.9	36.9

Source: Menon and others, "The economic impact of adult mortality on households in Rakai district, Uganda", in *Confronting Aids: Evidence from the Developing World*, M. Ainsworth, L. Fransen and M. Over, eds. (Brussels, European Commission and Washington, D.C., World Bank, 1998).

loans, as most households did not have enough savings or assets to cope with the costs, nor could they expect much help from government or employment benefits. In this setting, many women do not join the labour force after the death of a spouse because the society considers it inappropriate for a woman to work outside the home.

Two studies, one in Thailand and one in Sri Lanka, assessed the direct and indirect costs of an adult HIV/AIDS-related death on rural households. In the Thailand study, 116 households with an HIV/AIDS-related death were compared to 100 households with a non-HIV/AIDS-related death and to 108 households with no death (Pitayanon, Kongsin and Janjaroen, 1997). The study found that the economic impact of an HIV/AIDS-related death was substantial and generally greater than that for a non-HIV/AIDS-related death. The largest part of the economic cost was the loss of earnings of the deceased, but loss of household income from other sources was also important, as were decreases in household consumption. In order to cope with the loss of income resulting from the illness and death of a member of a household, households resorted to spending their savings, borrowing, and selling possessions including land, vehicles and livestock. The Sri Lanka study (Bloom and others, 1997) found that the direct costs per HIV/AIDS-related case were between 250 and 985 United States dollars ($), depending on the treatment regimen, whereas indirect costs ranged from $5,204 to $17,695. The bulk of the direct costs in the case of Sri Lanka were borne by the public sector, whereas indirect costs were more likely to be borne by the persons living with HIV/AIDS and their families and caretakers.

Mushati and others (2003) studied the consequences for households of adult terminal illness and death in eastern Zimbabwe. Nearly 80 per cent of those who died were the primary income earners for their households, and 60 per cent lost their jobs during their illness. One in 7 caregivers gave up a job to care for the sick person. Most health-care costs were paid by the sick person and his or her spouse (42 per cent) and by other household members (41 per cent).

2. *Impact on food consumption*

The HIV/AIDS epidemic has had an impact on food consumption in households. A study in Zimbabwe (Mutangadura, 2000) showed that households fostering maternal orphans had sold assets and switched from more expensive to cheaper commodities, and many households, especially in the urban area studied, reported decreased food consumption and switched to cheaper foods. The food security situation of the

surviving family was poorer after the death of an adult female. Some children (aged 10-15 years) in urban areas were forced to seek casual employment in order to buy food.

A Côte d'Ivoire study (Béchu, 1997) tracked 107 households with at least one adult AIDS victim. In contrast to households where the AIDS victim remained relatively free of symptoms, per capita consumption dropped in households where the AIDS victim either died or moved away. However, average per capita consumption had partially recovered within 10 months after the death occurred in the AIDS-affected households. This time pattern of consumption demonstrates the resiliency of the average household to the impact of death (World Bank, 1999). It also shows that, to achieve an adequate understanding of household impacts, it is important for studies to extend the period of observation beyond the few months leading up to and following an AIDS-related death.

TABLE 7. PERCENTAGE OF HOUSEHOLDS INDICATING A DECREASE IN THE CONSUMPTION OF FOOD ITEMS AFTER A DEATH IN THE HOUSEHOLD IN ZIMBABWE, 2000

Food item	*Urban (101)*	*Rural (114)*
Maize meal	34	16
Meat	79	75
Bread	72	80
Milk	71	61
Kapenta fish	0	33
Cooking oil	50	64
Sugar	48	61
Vegetables	5	0
Eggs	70	65
Pulse	44	11

Source: G. Mutangadura, "Household welfare impacts of mortality of adult females in Zimbabwe: implications for policy and program development", paper presented at the AIDS and economics symposium organized by IAEN, Durban, South Africa, 7-8 July 2000.

Another study in Thailand (Janjaroen, 1997) found that the average expenditure per adult equivalent household member was lower in households with an adult death than in households without deaths, but the differences between the two classes of households were very small and not statistically significant. However, a regression analysis showed that AIDS deaths had a larger negative impact on consumption than did non-AIDS deaths. Furthermore, this was true even after controlling for the duration of the illness, which also had a strong negative effect.

A study conducted in Uganda (Topouzis, 1994) found that malnutrition had risen in the village of Guru, especially among children, and that kwashiorkor was the main reason for child admissions in the hospital in the last three years. Prior to that period, few cases of malnutrition had been reported to the hospital. AIDS had also reduced the number of meals per day or limited the diet to one or two staple foods.

Change in household composition and structure

Most studies have found that the epidemic tends to increase the number of female-headed households and the number of households in which grandparents are caring for children. For instance, a study in Uganda (Topouzis, 1994) found that HIV/AIDS contributes to the rise of female-headed households. Compared to women

whose husbands die of other causes, AIDS widows tend to be younger and have dependent children who need to be looked after, which restricts their contributions to farm work and off-farm income-generating activities. A cohort study conducted in Uganda and covering 10,000 individuals in 15 villages (Mulder and others, 1995) found that the proportion of households headed by grandparents increased between the first and the sixth rounds. The households were characterized by a skipped generation structure, with missing adults in the economically active age groups. The skipped generation structures had the highest dependency ratio. A ten-year study in Malawi found that four out of five marriages in which one partner was HIV-positive at the baseline survey were no longer intact at follow-up (Floyd and others, 2003). Children with an HIV-positive parent at the time of the baseline survey were less likely to be alive and resident in the area and less likely to be living with either parent at the follow-up survey.

The loss of a breadwinner obviously tends to reduce the economic viability of the household that remains, and some households faced with this situation may disband, with the members dispersed to the homes of relatives. However, little is known about how frequently the situation occurs; most studies examine the current household configuration and are not designed to follow up households or household members who move out of the study area. In one study of rural South Africa, Hosegood, Herbst and Timaeus (2003) found that 5 per cent of households experienced at least one AIDS death during the one-year observation period and that those households were nearly three times as likely to dissolve as other households. Children aged under 15 in households with an adult death were more likely to migrate. A study in Uganda (Ntozi, 1997) inquired retrospectively about migration of the spouses of former household members who had died. The study also distinguished probable AIDS deaths from other causes of mortality. In total, 37 per cent of widows and 17 per cent of widowers had migrated from their original homes. For both sexes, migration was more common for younger spouses, and results suggested that those who were in worse health (possibly because of AIDS) were more likely to leave. In such a setting, it is not surprising that a higher proportion of women would move away, since women are generally not entitled to inherit the husband's property, and the women's own kin are likely to live elsewhere.

Remarriage is potentially another way of coping with the economic as well as the emotional and social losses resulting from the death of a spouse. In some societies there are strong traditional expectations that widows will remarry. If the death was a result of AIDS, however, the surviving spouse is quite likely to be infected, and remarriage poses a grave risk of spreading the disease. Little is known, however, about how marriage practices are actually changing in the face of this risk. In parts of Africa, it was traditionally expected that a widow, especially one still of reproductive age, would be "inherited" by the husband's brother or another male relative, and it was through that union that she and her children would continue to have access to property and other means of support. Data from Uganda in the early 1990s indicated that people were aware of the risk of contracting HIV/AIDS from sexual intercourse, and the practice of widow inheritance was reported to be in decline. Households that had experienced the death of a married person were asked about the spouse's subsequent remarriage. About one fourth of widowed women and over half of men had remarried. Approximately half the reported deaths were believed to have been due to AIDS, but roughly three quarters of the surviving spouses were reported to be healthy. While the actual HIV infection status of those who remarried was not known, the results suggested that many people were basing their decisions about risks of remarriage on the appearance of health. However, many of those who appeared healthy were likely in fact to have been infected by HIV (Ntozi, 1997).

Households may also try to adjust to the loss of an adult by sending some members, particularly children, to live with other relatives, or by taking in working-age relatives. The feasibility of doing this probably varies greatly between societies, depending on long-standing social customs and, for individual households, on the availability of suitable kin. In some African societies, for example, there is frequent "circulation" of both children and adults between households, even in the absence of emergencies. A review of changes in

household structure based on three follow-up studies in areas heavily affected by HIV/AIDS found that, in the cases of Uganda and the United Republic of Tanzania, many households added a member after a death occurred, with the result that the average household size following an adult death declined by less than one member and the dependency ratio in affected households rose by only a modest amount. By contrast, in Thailand, where households were smaller to begin with than in the African cases, the households where an adult died remained one person smaller even two years after the death, and their dependency ratio nearly doubled (World Bank, 1999).

4. *Impact of AIDS on older persons*

As mentioned above, one effect of the disease is to change the structure and composition of households. In many affected regions in developing countries, more and more older persons are taking care of AIDS orphans. Older parents may also provide end-stage care to their adult children afflicted with AIDS. A study conducted in Zimbabwe showed that older caregivers were under serious financial, physical and emotional stress owing to their care-giving responsibilities (World Health Organization, 2002). Other studies conducted in Thailand reached the same conclusion (Knodel and Im-em, 2002; Knodel and others, 2002). The AIDS epidemic not only puts more stress on older persons, but it also impoverishes them at the very same time they themselves may need to be taken care of. This is especially true in societies where younger relatives are responsible for the care of older persons.

There have been many reports of the growing burden on older persons of providing for grandchildren who have been orphaned by AIDS and of a rapid increase in the number of "skipped-generation" households—households in which grandparents are caring for grandchildren in the absence of the middle generation (see HelpAge International and International HIV/AIDS Alliance, 2003). Recent survey data, presented below, confirm that orphaned children are more likely to reside with grandparents than with other relatives or non-relatives. In addition, survey data confirm that substantial proportions of the older population of many countries are living in skipped-generation households and that such households tend to score lower than average on an index measuring quality of housing and household amenities (United Nations, forthcoming). Table 8 shows that in some African and Caribbean countries, 10-25 of all persons aged 60 or over are living in such households. For older women, the percentages are even higher, exceeding 30 per cent in the cases of Rwanda and Malawi (United Nations, forthcoming). Table 8 also provides support for the claim that the HIV/AIDS epidemic is responsible for a notable increase in the number of skipped-generation households. Even though most of the surveys represented in the table are less than 10 years apart, the percentage of older persons living in such households grew by 2.7 points on average in the countries where adult HIV prevalence was 10 per cent or more, while it increased by 1.5 points in countries with HIV prevalence of 2-9 per cent. By contrast, in most countries with lower HIV prevalence, there was little change or a decrease.

5. *Impact on children*

The education and well-being of children also suffer when AIDS strikes the household. A significant finding of a study in Zimbabwe (Mutangadura, 2000) was that children were unable to go to school after an adult death in the household, primarily as a result of a lack of money. In another study in Uganda, it was found that only one in every five children of AIDS-affected households in the village of Tororo remained in school. AIDS-affected families were often forced to take their children out of school as they either had no money for school fees or needed the children's labour (Topouzis, 1994). That result was also confirmed by a study in Zimbabwe in both urban and rural areas, which showed that the percentage of children attending school decreased from 98 per cent to 80 per cent after the death of a mother in urban areas, and from 100 per cent to 93 per cent in rural areas (Mutangadura, 2000).

TABLE 8. PERCENTAGE OF OLDER PERSONS LIVING WITH GRANDCHILDREN WHOSE PARENTS ARE NOT PART OF THE HOUSEHOLD

	Date		Percentage with grandchildren but not children		
Prevalence of HIV in 2001 and country	*Earlier*	*Later*	*Earlier*	*Later*	*Difference later - earlier*
HIV prevalence at least 10 per cent					
Cameroon	1991	1998	7.2	8.3	1.1
Kenya	1993	1998	14.3	13.9	-0.4
Malawi	1992	2000	21.5	25.0	3.5
Zambia	1992	2001-2002	13.6	21.3	7.7
Zimbabwe	1994	1999	16.7	18.4	1.7
Average			14.7	17.4	2.7
HIV prevalence 2.0-9.9 per cent					
Benin	1996	2001	8.1	9.3	1.2
Burkina Faso	1992-1993	1998-1999	6.8	6.8	0.0
Côte d'Ivoire	1994	1998-1999	6.5	7.2	0.7
Dominican Republic	1975-1976	1999	11.7	13.8	2.1
Ghana	1993	1998	17.4	17.9	0.5
Haiti	1994-1995	2000	10.5	13.5	3.0
Nigeria	1990	1999	8.0	9.3	1.3
Rwanda	1992	2000	21.3	25.4	4.1
United Republic of Tanzania	1992	1999	11.9	12.4	0.5
Average			11.4	12.8	1.5
HIV prevalence under 2 per cent					
Bangladesh	1993-1994	1999-2000	1.6	1.7	0.1
Bolivia	1994	1998	8.2	7.4	-0.8
Colombia	1990	2000	5.5	5.2	-0.3
Costa Rica	1976	1984	6.3	3.6	-2.7
Egypt	1992	2000	0.8	1.5	0.7
Guatemala	1995	1998-1999	6.1	6.3	0.2
India	1992-1993	1998-1999	1.7	1.8	0.1
Indonesia	1974-1975	1997	7.2	6.1	-1.1
Kazakhstan	1995	1999	3.5	3.1	-0.4
Madagascar	1992	1997	14.8	16.4	1.6
Mali	1995-1996	2001	8.8	8.6	-0.2
Nepal	1996	2001	2.6	2.9	0.3
Niger[a]	1992	1998	10.6	14.0	3.4
Paraguay	1982	1990	6.8	6.8	0.0
Peru	1977-1978	2000	8.1	6.2	-1.9
Philippines	1993	1998	8.3	8.5	0.2
Senegal	1992-1993	1997	3.3	2.9	-0.4
Turkey	1978-1979	1998	3.0	1.4	-1.6
Venezuela	1977	1981	5.8	5.4	-0.4
Average			5.9	5.8	-0.2

Source: *Living Arrangements of Older Persons Around the World* (United Nations, Department of Economic and Social Affairs, Population Division, forthcoming).

NOTES: Based on tabulations of the living arrangements of the household population aged 60 years or over, from sample surveys (primarily Demographic and Health Surveys) and censuses. The skipped-generation households—without any children of the respondent but with one or more grandchildren—may contain other relatives and non-relatives. Adult HIV prevalence in 2001 is taken from table 2 and UNAIDS, *Report on the Global HIV/AIDS Epidemic* (Geneva, 2002).

[a] For Niger, UNAIDS (2002) did not provide an estimate of adult HIV prevalence; available data were insufficient.

The impact of HIV/AIDS on children's education may also depend on the socio-economic status of the household. Thus, the poorer the household, the more likely the household is to take children out of the school system.

The impact of AIDS is also gender dependent. An adult woman's death may have especially far-reaching consequences for the household since women are the main caregivers in families. Women also tend to manage household budgets in ways that enhance the food and nutrition security of the entire household and of children in particular (Haddad, 1999). A study in the United Republic of Tanzania (Ainsworth, 1993) found that children were less likely to be enrolled in school when the household had experienced the death of a woman aged 15-50 in the previous 12 months. There was no association between school enrolments and the death of a man aged 15-50. Upon the death of a woman, the children tended to replace her domestic roles in the short run and dropped out of school to do so (Ainsworth, 1993). In Indonesia, the loss of a father tended to have a larger impact on the economic situation of the family, whereas the loss of a mother had a larger effect on child mortality and health (Gertler, Levine and Martinez, 2003).

Many children in AIDS-affected households are sent to live with other relatives, who may be able to provide them with better nutritional and economic conditions than they would have experienced had they remained in their original homes. In order to obtain a full picture of the impacts on children, it is therefore necessary to widen the view beyond the original household. The impact of a parent's death on children, especially children's education, is explored further in the following section, which focuses on the status of orphans.

6. *Impact on orphans*

The HIV/AIDS pandemic has led to increased attention to the fate of the growing number of orphans. At the end of 2001, an estimated 14 million children under 15 years of age had lost one or both parents to HIV/AIDS, 11 million of whom lived in sub-Saharan Africa (UNAIDS, 2002); the number is forecast to nearly double by 2010. Several recent studies have examined the relative welfare of orphans by comparing them to non-orphans in the same society with respect to levels of school enrolment, household economic status and, less frequently, nutritional and health status. A few studies have also tried to assess whether orphans' well-being differs depending on their living arrangements. Such large-scale, nationally representative studies have only recently begun to emerge, as information about the survival of children's parents has only recently begun to be gathered routinely in national-level surveys in developing countries. In most such studies it is not known whether particular children were orphaned as a result of HIV/AIDS, although, as would be expected, the percentage of children orphaned tends to be highest in the countries with the highest levels of HIV prevalence in the adult population (Bicego, Rutstein and Johnson, 2003). In 17 sub-Saharan African countries surveyed between 1995 and 2000, children under age 15 were, on average, more than twice as likely to have lost their father as their mother; about 10 per cent of those who had lost one parent had lost both (Bicego, Rutstein and Johnson, 2003).

a. *School attendance*

In all of the 44 countries for which information on school attendance was available by mid-2003, orphans who had lost both parents were less likely to be attending school than children with both parents alive and living with at least one biological parent. Moreover, in the limited number of countries with trend data, the gap between the two groups of children was widening. In sub-Saharan African countries, only 60 per cent of children aged 10-14 who lost both parents attended school, compared to 71 per cent of those with both parents still alive and living with at least one biological parent (United Nations, 2003b). In general, orphans who have lost only one parent have less consistently been found to be at an educational disadvantage, and when there is a disadvantage it is smaller than for children who have lost both parents (Monasch and Snoad, 2003; Bicego, Rutstein and Johnson, 2003; Ainsworth and Filmer, 2002; Case, Paxson and Ableidinger, 2003). Monasch and Snoad (2003), in a study of survey data in 40 sub-Saharan African countries, found that orphans' educational disadvantage tended to

be greatest in countries with low school attendance overall.

Girl children have a large educational disadvantage in many of the countries hard-hit by HIV/AIDS—does orphanhood have a disproportionate effect on the educational disadvantage of girls? Tentatively, the answer is no, in most cases. Although some studies have reported that girls were more likely than boys to be withdrawn from school because they were needed to help care for an AIDS victim or because there was a lack of funds, two studies based on national data for a large number of countries have found that the gender gap in enrolment for orphans was approximately the same as the gap for all children. Thus, orphanhood appears usually to produce a similar amount of educational disadvantage for children of both sexes (Ainsworth and Filmer, 2002; Case, Paxson and Ableidinger, 2003).

b. *Poverty*

Orphans are more likely than other children to be living in poor households and in female-headed households. An analysis of surveys in 28 countries (of which 23 were in sub-Saharan Africa) found considerable diversity in the degree to which orphans were found in poor households. However, in countries where there was a statistically significant difference, orphans were more likely than other children to live in poor households (Ainsworth and Filmer, 2002). Case, Paxson and Ableidinger (2003) found that it was mainly loss of the father alone that was associated with greater poverty.

Orphans are likely to be disadvantaged in areas besides education and household wealth, although this is less extensively documented. Studies in Burundi and the United Republic of Tanzania have found that the loss of a parent leads to higher prevalence of malnourishment in children (Ainsworth and Semali, 2000; Subbarao, Mattimore and Plangemann, 2001). In the Tanzanian study, a recent death of other adults in the household also increased malnutrition. However, for children with better access to health care, the adverse health effects were substantially reduced, showing that the ill effects can potentially be countered by appropriate health and nutrition policies (Ainsworth and Semali, 2000).

c. *Living arrangements*

The large majority of orphans live with the surviving parent, if there is one, or with other relatives, especially grandparents (Case, Paxson and Ableidinger, 2003). Table 9 shows the living arrangements of orphaned and non-orphaned children aged 6-14, averaged for 10 sub-Saharan African countries. Of the double orphans (mother and father both deceased), 4 per cent were living in households headed by a non-relative, a situation that is associated with a large educational disadvantage (see below).

An increasing number of orphans are living in households headed by older persons. A recently released study (UNICEF, 2003) also shows that the proportion of orphans living with their grandparents increased from 44 per cent in 1992 to 61 per cent in 2000 in Zambia. Orphans also tend to live in larger households headed by older relatives. In Lesotho in 2000, for example, more than 65 per cent of double orphans were living in households headed by persons aged 55 years or older, whereas only 30 per cent of non-orphans children were living in such households.

Long before the appearance of HIV/AIDS, child fostering was common in many African societies, not just as a means of providing for orphaned children, but as a normal part of an extensive network of exchanges of material and emotional support among kin. Sending a child to live for a while with relatives (or, less commonly, non-relatives) can be a way of providing a child with better access to education or other training, a way of helping to balance the composition of different households according to the members' labour needs or a way of sheltering a child while also providing companionship, household assistance and the prospect of future support to an older relative who would otherwise be alone. In some cases living with relatives may be a preferred option for children whose parents have divorced and remarried.

TABLE 9. ORPHANHOOD AND THE RELATIONSHIP TO HOUSEHOLD HEAD

Relationship to head	*Non-orphans*	*Maternal orphans*	*Paternal orphans*	*Double orphans*
			Percentage	
Son/daughter	78	4	48	0
Grandchild	12	23	20	32
Sibling	1	4	6	9
Other relative	6	18	16	29
Adopted/foster child[a]	2	4	7	25
Non-relative	1	2	2	4
Total	100	100	100	100

Source: A. Case, C. Paxson and J. Ableidinger, "Orphans in Africa", working paper (Princeton, New Jersey, Princeton University, 2003).

NOTES: Based on 164,689 observations in DHS surveys for 10 African countries: Ghana, Kenya, Malawi, Mozambique, Namibia, Niger, Uganda, United Republic of Tanzania, Zambia and Zimbabwe. The data are for all children aged 6-14 whose orphan status could be determined. See data source for additional explanatory notes.

[a]Information about the biological relationship is not available for this group.

The consequences of fostering for the children involved, as well as for the receiving household, may vary with the circumstances that gave rise to leaving the parental home. Faced with the crisis of parents' illness or death, most children may have relatives who will willingly take them in, but some may not. Furthermore, foster children may continue to receive material support from parents who are living elsewhere, but orphans lack that additional support. It should also be noted that fostering of AIDS orphans in most of the affected societies is occurring within a context of widespread poverty. Frequently, even households whose members are spared by HIV/AIDS have trouble providing themselves with adequate nutrition and shelter and lack the resources necessary to obtain health care and schooling for children. If such households are the ones available to take in orphaned children, inadequate resources will be further strained.

Some researchers have presented an optimistic assessment of the extended family to care for children orphaned by HIV/AIDS in the areas that they studied (for example, Urassa and others, 1997), but others have found signs that the traditional system is coming under severe strain as the number of orphans continues to grow and that many children are receiving inadequate support (for instance, Ntozi and others, 1999).

In Uganda, national-level data showed that, between 1992 and 1999/2000, the percentage of households that included a foster child under age 14 increased from 17 per cent to 28 per cent. Taking in a foster child often represented a significant burden. "Fostering households consume less, save less and invest less, with serious macroeconomic impacts on aggregate savings and investment in the economy" (Deininger, Garcia and Subbarao, 2001, p. 1). The same study also found evidence suggesting that the Government's adoption of policies in accordance with the goals of the World Declaration on Education for All, adopted at Jomtien, Thailand in 1990, had decreased the amount of educational disadvantage faced by foster children during the 1990s. Nonetheless, during the same period access to health services such as vaccination deteriorated, and foster children had been particularly affected. The results support the idea that broad-based policies aimed at increasing access to basic education, health care and other services have the potential to counteract many of the disadvantages faced by orphaned children (Deininger, Garcia and Subbarao, 2001).

A number of questions relate to the consequences of child fostering for the children involved. One that is of concern for policy is whether the educational disadvantage of orphans outlined above results from their being in poorer

households, or whether an additional disadvantage can be attributed to orphanhood itself. If the problem is household poverty alone, then resources and support targeted to poor households could compensate for the current educational disadvantage of all poor children, and no additional intervention would be required for orphans. However, if orphans are also disadvantaged relative to other children in similar economic circumstances, then directing resources to poor households may not be enough.

A study using nationally representative data for 10 sub-Saharan countries (Case, Paxson and Ableidinger, 2003) found that greater household poverty did not completely account for orphans' lower school enrolment. In "blended" households that contained both orphaned and non-orphaned children, orphans were less likely to be in school than were other children in the same household; children aged 6-14 years who had lost either the mother or the father were on average about 5 percentage points less likely than non-orphans to be in school, and double orphans were 16 percentage points less likely to be in school. Household poverty led to substantially lower enrolment for all children, but orphanhood resulted in an educational disadvantage that was separate from that arising from poverty. The study also found a child's degree of relatedness to the household head had an effect on whether the child was in school. Living with a grandparent was associated with the least disadvantage, relative to being with a parent, and children living with more distant relatives were more disadvantaged. The small percentage of children living in a household headed by non-relatives were at an enormous disadvantage in terms of school enrolment, having an estimated average enrolment rate 46 percentage points lower than that of children whose parent was the head of household. In some countries very few of such children attended school (Case, Paxson and Ableidinger, 2003).

Concern has frequently been voiced that, as the AIDS crisis worsens, orphaned children will be left without any guardian. The situation certainly does occur, for there are numerous anecdotal reports. However, there is almost no evidence about what proportion of orphans is involved, how long such situations persist or how the children fare over periods of several years. One study of a hard-hit area in Uganda found that 3 per cent of households had no resident adult aged 17 years or older (Nalugoda and others, 1997). Another study of Ugandan households that had experienced a death in the preceding 10 years reported that about one per cent were headed by children under age 18 in both 1992 and 1995 (Ntozi and Zirimenya, 1999). A small study in Zimbabwe investigated the circumstances that had led to the establishment of households headed by a child aged under 18 (27 households) or a young adult aged 18-24 (16 households). For 30 per cent of the households there was no known relative who could have taken care of the orphans, and in most of the others relatives were reported to be unwilling to take the orphans in. In a minority of cases the children also did not want to live with the relative. Although in many cases relatives provided material support and visited regularly, about one third of the households known to have living relatives did not receive material support from them (Foster and others, 1997). It should be noted that large-scale surveys do not, in general, provide a good basis for studying the phenomenon of child-headed households. The Demographic and Health Surveys, for example, require that an adult be available for interviewing, which means that child-headed households would tend to be missed (Bicego, Rutstein and Johnson, 2003).

There is also no reliable statistical information about trends in the number of children residing in orphanages in the AIDS-impacted developing countries. Orphanages are generally regarded as an undesirable option for providing shelter to the swelling population of AIDS orphans. Not only do most people in the developing countries affected view this as a culturally unacceptable arrangement, but orphanages are also viewed by experts on child-care as tending to provide a poor setting for child welfare and development. It is also very expensive to provide good-quality institutional care (see, for example, UNAIDS, 2002, pp. 133-135; UNAIDS, UNICEF and USAID, 2002, p. 12). Nonetheless, orphanages are a last resort for children who have no family that can take them in, and a number of studies reviewed for the present report mention community-based, religious or other non-governmental organization-supported orphanages or group homes as an aspect of local

responses to the problem (for instance, Phiri and Webb, 2002; UNICEF and UNAIDS, 1999; UNICEF, 2002; Ntozi and Nakayiwa, 1999).

In summary, recent studies have shown that orphans are at a substantial disadvantage. The amount of educational disadvantage is greatest for orphans that have lost both parents. The lower school enrolment among orphans is not entirely explained by the greater poverty of households where orphans live, although poverty itself confers a large disadvantage on orphans and non-orphans alike. Even though grandparent-headed households tend to be female-headed and poor, living with a grandparent is, on average, associated with higher educational enrolment for orphans than is living with other relatives, particularly more distant relatives. Orphans who live with a non-relative, though they are a small minority, are at an enormous educational disadvantage. Girl children have much lower enrolment ratios than boys in many of the countries impacted by HIV/AIDS; however, orphanhood by itself generally disadvantages boys and girls equally with respect to schooling. Available evidence also points to nutritional disadvantage for orphans. Taking in orphans represents a substantial economic burden for many of the receiving households as well. Although many orphans live in households that are relatively well-off economically, in many settings orphans are disproportionately living in poor households.

C. Conclusions

The empirical evidence shows that the AIDS epidemic is having a huge impact on households. Indeed, households and families bear most of the burden since they are the primary units in which individuals cope with the disease.

- **Medical and health expenditures are increasing in HIV/AIDS-affected households**. Studies conducted in Sri Lanka, Thailand, Uganda and the United Republic of Tanzania, to name a few, showed that HIV/AIDS-related illnesses are putting a heavy financial burden on households affected by the epidemic.

- **Households affected by HIV/AIDS often move from relative affluence into poverty.** Studies in Burundi, Côte d'Ivoire, Haiti and Zambia showed that many changes occurred in the AIDS-affected households, including loss of paid employment, increasing borrowing and the sale of possessions. The decrease of revenue from loss of labour is an important impact of AIDS.

- **Food consumption decreases in many HIV/AIDS-affected households**. The change in food intake leads to malnutrition, especially among children. In parts of Africa, households affected by HIV/AIDS tend to decrease their consumption and switch to cheaper goods. In Thailand, one third of households affected by HIV/AIDS reported an average decrease in household income of 48 per cent.

- **Family structure and household composition are changing.** Increasing numbers of households are headed by grandparents or by women without husbands.

- **AIDS adds stress to the lives of older persons.** It kills their adult children, who would have been responsible for their care in old age, and it thrusts them into the role of caregivers for their orphaned grandchildren.

- **The impact of AIDS on households is also gender dependent.** Deaths of adult men tend to have a larger impact on household income, while a woman's death has especially severe consequences for children because women are the main caregivers in families.

- **Children are leaving school prematurely** to care for ill parents and for economic reasons. Double orphans are much less likely than other children to be in school. Based on recent sample surveys, in sub-Saharan African coun-

tries only 60 per cent of children aged 10-14 who lost both parents attended school, compared to 71 per cent of those with both parents still alive and living with at least one biological parent.

- **Fostering orphans is a common cultural practice, especially in African societies, but the rapid rise in the number of orphans may overwhelm the traditional support system of the extended family**. Many of the households that are taking in orphans are themselves poor, and taking in orphaned children represents a significant burden.

- **Orphans suffer disadvantages in education, nutritional status and well-being.** Households where orphans live are, in many settings, more likely than others to be poor, but orphanhood also leads to an educational disadvantage separate from that attributable to poverty alone. Orphans who live with non-relatives are at an enormous educational disadvantage. In some places—Burundi and the United Republic of Tanzania, for example—the loss of a parent is associated with a higher prevalence of malnutrition.

IV. IMPACT ON FIRMS

The impact of the HIV/AIDS epidemic goes far beyond the household level. Firms and businesses may also be affected as HIV-infected people are usually in the prime working years and are involved in the process of production. If HIV prevalence reaches a high level in a country or within a firm, the impact of the disease may be dramatic for the business or firm involved. The present chapter introduces a conceptual framework for the analysis of the impact of HIV/AIDS on firms. It then assesses the empirical evidence available on costs, productivity and profitability. It also considers the response of firms to the epidemic.

A. CONCEPTUAL FRAMEWORK FOR THE IMPACT OF HIV/AIDS ON FIRMS

As HIV infection progresses to AIDS, affected workers are likely to be absent from the workplace more and more often. The periods of absenteeism may affect the productivity of the firm, especially if the worker occupies an important position in the firm and consequently is more difficult to replace. The framework in figure 9 maps out the following processes through which HIV/AIDS affect firms:

- AIDS deaths may lead directly to a reduction in the number of available workers, since the deaths occur predominantly among workers in their most productive years. As younger, less experienced workers replace experienced workers, worker productivity may be reduced.

- The impact of AIDS also depends on the skills of affected workers. In the event that skilled workers who occupy important positions in the firm become sick or die from AIDS, the company may lose its institutional memory—the know-how accumulated through many years of experience.

- Firms that have a health programme may find themselves responsible for substantial medical costs. The insurance scheme of the firm may become more expensive as insurance companies increase the costs of coverage in response to high HIV prevalence rates in firms. Higher costs could impede saving for investment. HIV/AIDS in the workplace may also lead to increased funeral expenses for workers.

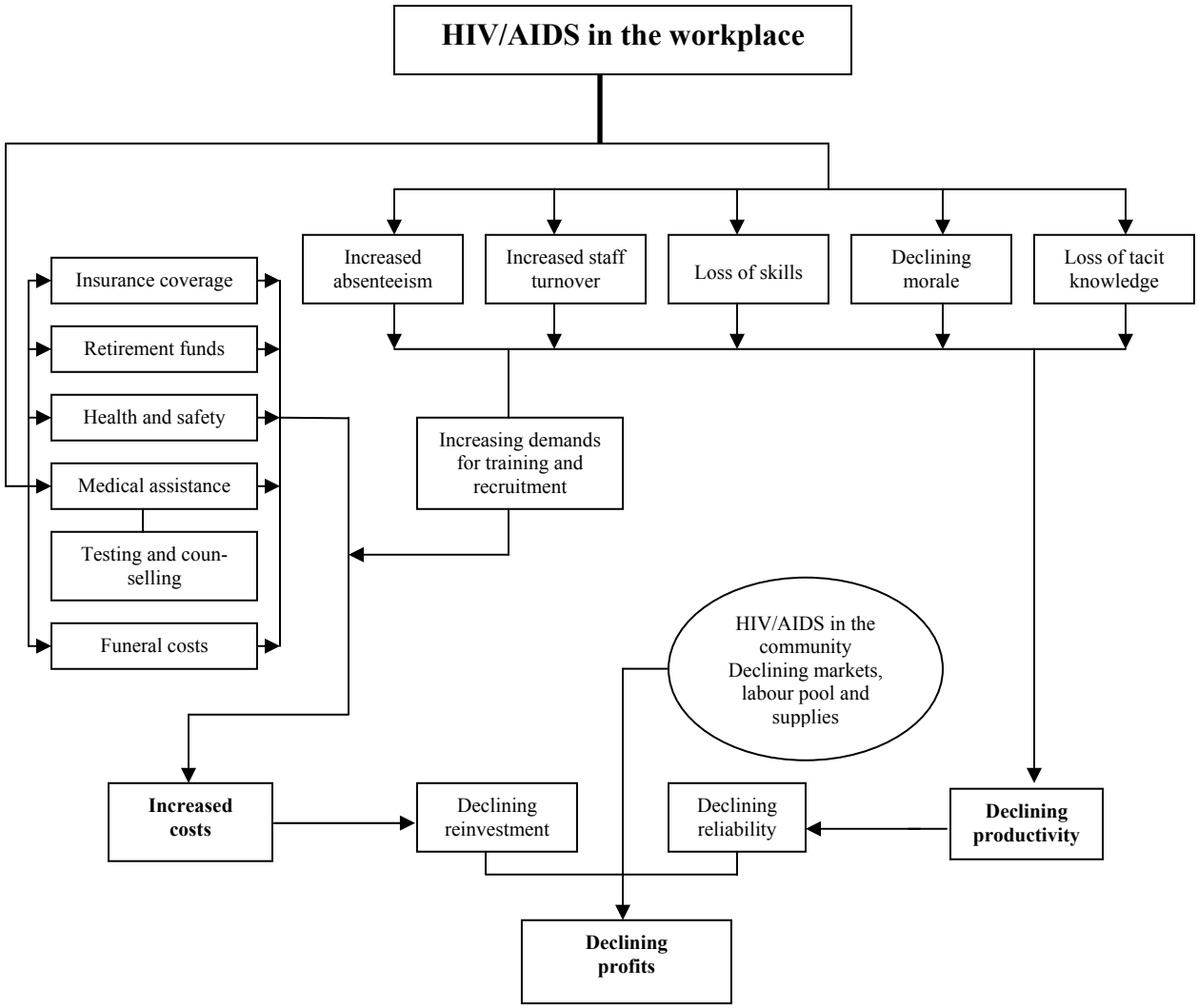
- Morale and productivity of the remaining workers may also suffer as co-workers fall ill and die. Equally important in the increase of costs may be the growing demand for training and recruitment to replace the ailing personnel of the firms.

- Another impact of the HIV/AIDS epidemic in the community is the impoverishment of households, which leads to a decline in the demand for some types of goods. The companies producing those goods may find themselves with a shrinking market, which may eventually lead to declining profits for the firms involved in the production of the goods.

To sum up, the HIV/AIDS epidemic is likely to result in increased costs and declining productivity for firms, which ultimately will lead to declining profits. However, the magnitude of the impact of HIV/AIDS will depend primarily on five factors (Loewenson and Whiteside, 1997):

1. The number of people infected in the firm;
2. Their role in the company;
3. The structure of the production process and its ability to cope with absenteeism;
4. The benefits provided by the company;
5. The effect on the business environment of HIV/AIDS in other companies and in the Government.

Figure 9. Conceptual framework for the socio-economic impact of the HIV/AIDS epidemic on firms



Source: UNAIDS, Global Business Council on HIV/AIDS and Prince of Wales Business Leaders Forum, *The Business Response to AIDS: Impact and Lessons Learned* (Geneva, 2000).

The following section presents the evidence available concerning the impact of AIDS on firms and companies.

B. Empirical evidence of the impact of HIV/AIDS on firms

Many companies have undertaken studies on the impact of AIDS on their workforce and productivity. Unfortunately, the results of most of the studies are not available to the public. Nevertheless, the few studies whose results are available point to a serious impact of HIV/AIDS on companies in some settings and to the potential for the effects to grow rapidly as the epidemic advances.

A review in 2001 characterized the literature on AIDS and business as "remarkably thin", with many studies having small sample sizes and a narrow focus on one or two industries in a particular country. In addition, most of the stronger studies pertain to the early 1990s, a time when the epidemic was only beginning to have a noticeable effect in many countries. The authors of the re-

view found "a pattern of small but significant impacts" and observed that, "as the epidemic deepens, so will the effects on businesses change, meaning that some of the more robust studies may have little to tell us about the current situation, let alone the one that businesses will face in ten years" (Bloom, Mahal and River Path Associates, 2001, pp. 8 and 12).

1. *Absenteeism and deaths*

High levels of absenteeism seem to be one of the characteristics of the impact of HIV/AIDS on firms. For example, a study of 15 different establishments in Ethiopia found that the companies were experiencing considerable absenteeism. The number of HIV/AIDS-related illnesses was 53 per cent of all reported illnesses, totalling 15,363 incidents over a five-year period (Bersufekad, 1994). Out of 19 individuals interviewed in detail, 11 lost 30 days over a period of one year from HIV/AIDS-related illnesses and 7 lost on average 60 days, while one person said he had been absent for 240 days because of AIDS. The study was not able to quantify the impact of HIV/AIDS on the productivity of those establishments.

As a result of the absenteeism of infected workers, which ultimately is followed by their deaths, the impact of AIDS can be devastating in some companies. A study of a sugar estate in Swaziland illustrated how quickly the number of AIDS-related deaths could increase, sapping the progress made by the company and resulting in declining productivity. The study showed that 25 per cent of the estate's workforce was infected with the HIV virus and would die within the next 10 years (Morris, Burge and Cheevers, 2000).

In Namibia, NamWater, the largest water purification company, announced in 2000 that HIV/AIDS was crippling its operations (Angula, 2000). They reported a high staff turnover from HIV-related deaths, increasing absenteeism and a general loss of productive hours.

A study of Lonrho companies in Malawi found that death-in-service benefits increased by more than 100 per cent between 1991 and 1996 (Ntirunda and Zimda, 1998). The study also found that AIDS-related costs were 1.1 per cent of the total costs and 3.4 per cent of gross profits of the companies in 1992. Another study of five firms in Botswana found that the impact of HIV/AIDS depended on the type of business, the skill level of employees, the types of benefits provided and the amount of savings held (Stover and Bollinger, 1999).

A study of 18 firms in Lusaka, Zambia, showed that, of 68 deaths in a 10 month-period in 1993, 37 per cent were general workers, 30 per cent were from lower management, 21 per cent were from middle management and 12 per cent were from top management. AIDS-related symptoms accounted for 56 per cent of deaths in general workers and 62 per cent of top management (International Labour Organization, East Africa Multidisciplinary Advisory Team, 1995). The study showed an association between HIV/AIDS and longer periods of absenteeism, but the loss of staff and its impact on productivity is only one part of the impact of HIV/AIDS.

The impact of HIV/AIDS on firms depends on the age structure of the workers in the firm. For example, a study conducted in Zambia in Barclays Bank showed that mortality peaked in the age group 30-39. The death rate rose from 0.4 per cent to 2.2 per cent between 1987 and 1991, and the bank paid more than 10 million Kwacha ($58,140) in payments to the families of employees who died from HIV/AIDS (Smith and Whiteside, 1995). The study also showed that medical expenses and training costs were on the increase, whereas man-hours were reduced.

2. *Costs to the companies*

Most available studies have reached the conclusion that the HIV/AIDS epidemic causes an increase in costs of production and a decrease in revenues. Table 10 presents the costs of the HIV/AIDS epidemic to six companies. Companies offering health benefit packages (as opposed to firms offering no health provision) suffer the greatest loss.

The cost of HIV/AIDS to companies depends on the type of company. In Kenya, the AIDS Control and Prevention Project (AIDSCAP), funded by the United States Agency for International

TABLE 10. COST TO SELECTED COMPANIES OF THE HIV/AIDS EPIDEMIC IN AFRICA
(*United States dollars*)

Company name	*Total annual cost of AIDS*	*Annual cost of AIDS per employee*
Botswana Diamond Valuing	125 941	237
Botswana Meat Commission.....	370 200	268
Côte d'Ivoire food processing.....	33 207	120
Côte d'Ivoire packing firm	10 398	125
Muhoroni Sugar, Kenya.....	58 398	49
Uganda Railway Corporation.....	77 000	300

Source: J. Stover and L. Bollinger, The economic impact of AIDS (Glastonbury, Connecticut: The Futures Group International, 1999).

Development, conducted a study on the costs of HIV/AIDS per employee by type of industry and found that wood processing and sugar estates were the two industries where HIV/AIDS-related costs consumed much of the profits (table 11). The differences observed in the costs are probably a result of the way in which the companies treat their employees. Although wages in the sugar industry and wood processing plants are lower than those in heavy industry and transport, employees tend to be housed on estates and provided with many benefits, such as medical care. Projections of the costs in the near future show a three-fold increase in costs per employee in the wood processing industry and on sugar estates between 1992 and 2005, rising from $115 to $331 and from $237 to $720 respectively.

TABLE 11. COSTS OF HIV/AIDS PER EMPLOYEE IN KENYA
(*United States dollars*)

Type of industry	*1992*	*2005*
Heavy industry	16.45	39.03
Transportation	30.83	75.12
Wood processing.....	114.62	331.09
Sugar estate	237.81	720.05

Source: AIDSCAP, "Comparative experience with worksite prevention programmes in Africa: Zimbabwe, Tanzania and Kenya", XI International Conference on AIDS, Vancouver, Canada, 7012 July 1996 (abstract Th. D. 373).

Not only do HIV-affected firms lose their workers as a result of absenteeism or AIDS-related deaths, but they also experience an increase in their medical benefits and costs. At the present time, it is difficult to measure the impact, as most countries are still in the early stages of the epidemic.

In the United Republic of Tanzania, a survey of six firms found that the annual average medical and burial costs per employee increased 3.5 times and 5.1 times respectively between 1993 and 1997 because of AIDS (Clancy, 1998). Another survey of three businesses in Abidjan calculated AIDS-related costs, including medical care, HIV screening, prevention, funeral attendance and lost productivity. The average annual cost as a percentage of wages ranged from 0.8 per cent to 3.2 per cent in the three firms, depending on the firm's social policies (Aventin and Huard, 1997).

In a recent cost-benefit analysis of six firms in Botswana and South Africa, Rosen and others (2003) estimated that AIDS was responsible for 1 to 6 per cent of labour costs per year and concluded that investment in prevention and treatment would result in a net gain for most companies.

Models of the costs of AIDS in Zimbabwe estimated that costs to the Zimbabwe mining industry would increase 12-fold between 1995 and 2010 and that training costs to replace skilled

workers would increase five-fold by 2000 (Forgy, 1993). Another study evaluated the costs of AIDS as a percentage of wages, production or profits and found that the cost of AIDS was between 0.8 per cent and 3.2 per cent in Abidjan in 1997 (Aventin and Huard, 1997).

While many studies have focused on the total additional costs attributable to HIV/AIDS, fewer have attempted to measure the share of costs incurred by firms by the type of costs. Table 12 presents HIV-related costs by comparing the findings of three surveys in Kenya, Zambia and Makandi, Zimbabwe. In Kenya and Zambia, absenteeism seems to account for the largest share of the costs, whereas medical costs are more important than any other costs in the Makandi study. Deaths seem to take the second largest share of the costs in Zambia and Makandi, where they represent 16 and 32 per cent of the total costs respectively. In the 1992 Zambia study, replacement of managers or skilled workers by expatriate workers is responsible for 13 per cent of all costs due to HIV/AIDS.

The impact of HIV/AIDS on small-sized firms may be even more devastating. As pointed out by Loewenson and Whiteside (1997), "anecdotal evidence indicates that the consequences may be even more significant for small enterprises. They do not have the human or financial resources to weather the impact and may, as a result, collapse".

3. *Impact on productivity and profitability*

A study of 992 firms in five sub-Saharan African countries (Ghana, Kenya, United Republic of Tanzania, Zambia and Zimbabwe) used data collected in 1994 from the World Bank Regional Programme on Enterprise Development to examine the attrition of workers caused by illness or death and the cost to firms of replacing them (Biggs and Shah, 1997; World Bank, 1999, box 1.4, p. 35). The study found that the rate of attrition from illness and death was indeed higher in the countries with a higher prevalence of HIV/AIDS (table 13). However, even in the settings where HIV/AIDS prevalence was highest,

TABLE 12. HIV/AIDS-RELATED COSTS: A COMPARISON OF VARIOUS SURVEYS
(Percentage)

	Zambia 1992	*Kenya 1994*	*Makandi, Zimbabwe 1995-1996*
Absenteeism	31.8	54.3	25.2
Expatriate employment	12.7	—	—
Medical service	14.7	12.0	37.8
Funerals	5.1	10.1	4.7
Deaths in service	15.9	—	32.3
Travel	12.5	—	—
Training and recruitment	7.3	26.3	—
Total	100	100	100

Source: R. Loewenson and A. Whiteside, "Social and economic issues of HIV/AIDS in Southern Africa" (Harare, Southern Africa AIDS Information Dissemination Service, 1997.

NOTE: A dash (—) indicates the amount is nil or negligible.

TABLE 13. WORKER ATTRITION IN GHANA, KENYA, UNITED REPUBLIC OF TANZANIA, ZAMBIA AND ZIMBABWE, TOTAL, AND BY SICKNESS OR DEATH, 1994

		Total sample		*Percentage of workers leaving*	
Country	*Urban HIV Prevalence*	*Number of firms*	*Number of workers*	*Due to all causes*	*Due to sickness or death*
Zambia	24.7	194	14 582	20.8	2.5
Zimbabwe	20.5	199	59 210	9.1	1.2
Kenya	17.1	214	17 126	7.7	0.9
United Republic of Tanzania	16.1	197	14 611	19.3	0.6
Ghana	2.2	188	9 607	11.6	0.3
Total		992	115 136	11.9	1.15

Source: World Bank, *Confronting AIDS: Public Priorities in a Global* Epidemic, Revised Edition (New York, Oxford University Press, 1999).

illness and death were responsible for only around 12-13 per cent of worker attrition. In addition, about three quarters of the workers who left owing to illness or death were classified as unskilled or semi-skilled, and such workers were quickly replaced (in two weeks on average for unskilled workers and three weeks for the semi-skilled). It took longer—about 24 weeks—to replace professional workers. At the same time, as a result of economic conditions, many firms chose not to replace workers who left: employers did not replace 38 per cent of the professionals and 51 per cent of the unskilled workers. The authors concluded that worker attrition significantly affected firm performance but that AIDS-related attrition had not yet had a significantly negative effect on African firms.

The study by Biggs and Shah (1997) is unusual in covering a wide range of firms in a comparable manner in a range of African countries. It should be noted that the study's results pertain to 1994 and that the number of deaths from HIV/AIDS has risen substantially since then. Bloom, Mahal and River Path Associates (2001) have advocated updating this study in particular, in order to test ideas about how the deepening HIV/AIDS epidemic is affecting the workforce.

Few studies have attempted to quantify the effects of HIV/AIDS on workers' productivity or efficiency. A study of a tea estate in western Kenya (Fox and others, 2003) provided some of the first empirical estimates of the impact of HIV/AIDS-related morbidity on labour productivity. Company records showed lower output in kilograms of tea leaves plucked and higher use of leave time on the part of HIV-positive workers as compared with non-infected workers. Productivity continued to decline as the disease progressed. In the last year of life, workers who died of AIDS produced 38 per cent less tea and took nearly twice as much leave time as others. Those figures were almost certainly underestimates because workers often brought unrecorded "helpers" to assist them and prevent them from losing their jobs.

Studies concerning the impact of AIDS on profitability in Africa have had mixed results. Studies completed in South Africa (Morris, Burdge and Cheevers, 2000) and Kenya (Roberts, Rau and Emery, 1996) suggested that the economic impact of HIV/AIDS on profitability was likely to be substantial. On the contrary, studies in Zambia (Smith and Whiteside, 1995), Malawi (Jones, 1996) and Botswana (Greener, 1997) indicated that the impact of HIV/AIDS on profitability was not substantial.

4. *Indirect impact of HIV/AIDS on firms*

In addition to the direct effects arising from increased costs and loss of productivity, firms

confronted with a high level of adult HIV prevalence may be faced with other, less quantifiable effects. For example, HIV/AIDS can result in a substantial decline in morale among workers. As employees witness the deaths of their co-workers, they may adopt a fatalistic attitude towards work and life in general, which may have a detrimental impact on the production of firms.

Absenteeism may also result in extra work for healthy workers who have to stand in for sick colleagues. In some companies, healthy workers were increasingly working extra hours to compensate for the time lost by their sick colleagues. The result was that companies not only paid more extra hours but also exhausted the healthy workers. Working long hours can produce stress among employees, which may result in a decline in both the quantity and quality of the final product.

5. *Business response to HIV/AIDS*

The response of businesses to the HIV/AIDS epidemic has taken many forms. Some companies have increased medical care and instituted prevention programmes to help workers avoid contracting the virus. As mentioned above, a cost-benefit study by Rosen and others (2003), concluded that company investment in prevention and treatment would result in a net gain for most companies. Other companies have taken the opposite approach. Some have changed hiring practices to screen out high-risk and infected applicants or have dismissed workers who are suspected of having HIV/AIDS. Some firms have reduced employee benefits, restructured employment contracts, outsourced less-skilled jobs and changed production technologies to require fewer workers. Some of the practices are illegal, and much of the information is anecdotal (Rosen and Simon, 2002). Firms are also hiring and training older workers, who are less likely to have HIV/AIDS (Engel, 2002). The private sector has greater scope than Government, households and non-governmental organizations to shift the burden and avoid the costs of the disease.

In South Africa, more than two thirds of large employers have recently reduced health care benefits or required larger contributions by employees. A survey of 56 large South African employers in 1999 found that 78 per cent had restructured their health care benefits in the previous two years, mainly by capping company contributions, reducing benefit levels and increasing employees' share of the cost. As a result, 36 per cent of the employees with access to company-sponsored medical plans had opted out, mainly because of the cost (Rosen and Simon, 2002).

Many companies are attempting to cut costs and prevent new HIV infections at the same time. Prevention programmes usually include AIDS education for workers and their families, treatment of sexually transmitted diseases (STDs) and distribution of condoms (Simon and others, 2000). Reliable information about the success of prevention efforts is scarce.

Studies on the impact of HIV/AIDS conducted within companies will be beneficial to policymakers only if the results of the studies are made available. Hence, efforts should be made to disseminate results while protecting the privacy of infected persons within the company. Many companies regard this information as too sensitive to release.

C. CONCLUSIONS

Available studies of the impact of HIV/AIDS on firms point to an impact of the epidemic on the labour force, costs and productivity, depending on the skills of those who are affected and whether they are replaceable or not. The following effects have been established:

- **Firms and companies are facing substantial cost increases resulting from HIV/AIDS that threaten their viability.** The situation has been documented in Botswana, Kenya and Uganda. The annual cost of AIDS per employee was estimated to range from $49 for a Kenyan sugar firm to $300 for the Uganda Railway Corporation.

- **The impact of HIV/AIDS on firms depends on the age structure of the workers in the firm.** For example, in the Barclays Bank in Zambia, mortality peaked in the age group 30-39.

- **The extent to which people living with HIV/AIDS will continue to be part of the workforce depends largely on the type of work performed, the stage of the disease and the existing policies in the relevant companies.** Workers in physically demanding jobs may find it more difficult to maintain their jobs when they become ill. Depending on the work legislation available, certain companies may be required by Government to continue to offer benefits for the employees who fall ill. Hence, those companies are more vulnerable to the impact of HIV/AIDS. However, the impact depends both on the types and costliness of the benefits offered and on the value the business gets back in terms of healthier workers and the firm's ability to attract and retain qualified employees.

- **The impact of the HIV/AIDS epidemic on companies may be concealed by the economic structural adjustments that many African countries are undergoing**. In some cases, the programmes lead to a downsizing of the workforce or, in other cases, to the closing down of the companies. In that environment, some managers may view the loss of staff as not necessarily a bad thing. As a result, it is sometimes difficult to separate the impact of HIV/AIDS on the workforce from the impact of other forces.

- **The varying levels of the impact of HIV/AIDS on firms may also reflect the production structures and benefits packages of the firms**. Firms that are more labour intensive and those that provide substantial benefits are likely to be the hardest hit.

V. IMPACT ON AGRICULTURE

The great majority of the population in the countries most affected by HIV/AIDS live in rural areas. In many African countries, farming and other rural occupations provide a livelihood for more than 70 per cent of the population. Hence, it is to be expected that the HIV/AIDS epidemic will cause serious damage to the agriculture sector in those countries, especially in countries that rely heavily on manpower for production. The present chapter explores the issues related to the impact of HIV/AIDS on agriculture. First, a conceptual framework for analysis of the impact of HIV/AIDS on agriculture is presented, based on previous work by the Food and Agriculture Organization of the United Nations (FAO), followed by a presentation of the evidence available on the impact of HIV/AIDS on agriculture.

A. Conceptual framework for the impact of HIV/AIDS on agriculture

HIV/AIDS can affect agriculture in many ways (figure 10):

- Absenteeism caused by HIV-related illnesses and the loss of labour from AIDS-related deaths may lead to the reduction of the area of land under cultivation and to declining yields resulting in reduced food production and food insecurity.

- The loss of labour may also lead to declines in crop variety and to changes in cropping systems, particularly a change from more labour-intensive systems to less intensive systems. Livestock production may become less intensive, and weeding and pruning may be curtailed. A shift away from labour-intensive crops may result in a less varied and less nutritious diet.

- The reduction in labour supply through the loss of workers to HIV/AIDS at crucial periods of planting and harvesting could significantly reduce the size of the harvest, affecting food production.

- Loss of knowledge about traditional farming methods and loss of assets will occur as members of rural households are struck by the disease and are not able to pass on their know-how to subsequent generations.

- Loss or reduction of remittances is likely to occur in areas where agricultural workers send money home while working abroad. When the workers become sick, they can no longer earn money to send home.

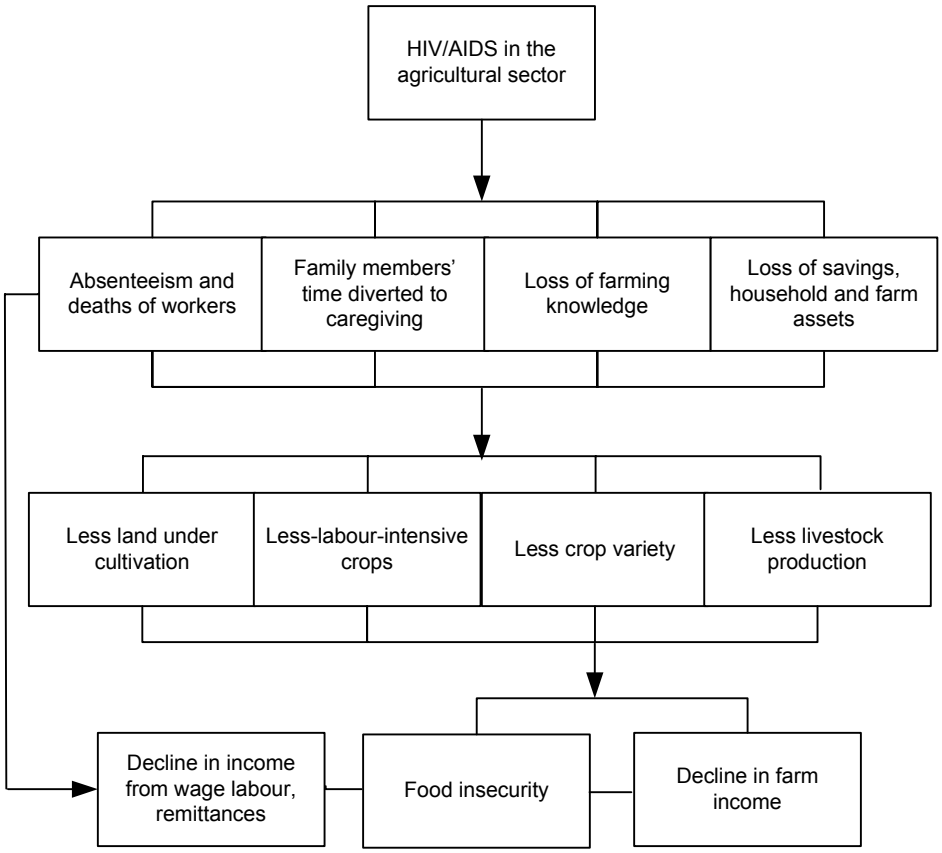
Consequently, the important impacts of the HIV/AIDS epidemic on agriculture are food insecurity caused by the reduction of production, and loss of income from household members employed in the sector.

The HIV/AIDS epidemic may also affect the traditional coping mechanisms that are often found in rural areas. Traditionally, local residents have joined together to offer assistance to those in need during periods of shock or crisis. Indeed, community-based initiatives have become one of the outstanding features of the epidemic and a key coping mechanism for mitigating the impact of HIV/AIDS (UNAIDS, 2002). However, as the number of HIV/AIDS cases increases, the need for assistance may overwhelm the support system, and traditional coping mechanisms may begin to break down.

B. Empirical evidence of the impact of HIV/AIDS on agriculture

Many of the studies assessing the impact of HIV/AIDS on agriculture have been conducted under the auspices of the Food and Agriculture Organization. Of the AIDS impact studies conducted so far, the majority have dealt with the rural world, that is, agriculture and livestock.

Figure10. Conceptual framework for the impact of the HIV/AIDS epidemic on agriculture



Source: United Nations, Department of Economic and Social Affairs, Population Division.

1. *Impact on food security and changes in cropping patterns*

One of the main impacts of HIV/AIDS on agriculture is its impact on food security. For example, a survey carried out in 1997 in Zimbabwe, a country with an adult prevalence rate of more than 25 per cent, estimated production loss in AIDS-affected households. The survey, conducted by the Zimbabwe Farmers' Union, found that agricultural output declined by nearly 50 per cent in the households affected by AIDS (Kwaramba, 1997). Maize production by smallholder farmers, and commercial farms declined by 61 per cent as a result of illness and deaths from AIDS (table 14). Those production losses could result from a number of factors, including shifting production patterns. However, according to Kwaramba, at that time the Zimbabwe data did not indicate a dramatic switch from cash to subsistence crops.

TABLE 14. REDUCTION IN OUTPUT IN AIDS-AFFECTED HOUSEHOLDS, ZIMBABWE

Crop	*Production loss (Percentage)*
Maize	61
Cotton	47
Vegetables	49
Ground nuts	37
Cattle	29

Source: Kwaramba, *The Socio-economic Impact of HIV/AIDS on Communal Agricultural Production Systems in Zimbabwe* (Harare, Zimbabwe Farmer's Union and Friederich Ebert Stiffung, 1997).

By contrast, in Côte d'Ivoire, a 1997 study found that switching to food crops rather than cash crops led to a drop in production by two thirds of previous levels (Black-Michaud, 1997). In addition, reduced remittances resulting from illnesses or deaths of migrant workers were found in Burkina Faso, whose nationals migrate to Côte d'Ivoire as seasonal agricultural workers.

In a study conducted in Burkina Faso in 1997, it was found that in two villages, Sanguié and Boulkiemdé, shifting work patterns and an overall reduction in food production had occurred as a result of the HIV/AIDS epidemic. The same study found that net revenues from agricultural production had decreased by 25 to 50 per cent (FAO, 1997). The Government of Swaziland also reported a 54 per cent drop in agricultural production in households where at least one adult member died from AIDS (*Wall Street Journal*, 9 July 2003).

A study in the United Republic of Tanzania showed that a woman whose husband was sick was likely to spend 45 per cent less time on agriculture than if the husband were healthy. In Kagera, a survey showed that, on average, adults in households that experienced a death spent five hours less on farming during the previous week than those without a death (Mutangadura, 2000).

In Kenya, a study found that the commercial agricultural sector was facing a severe social and economic crisis caused by HIV/AIDS (Rugalema, 1999). The loss of skilled and experienced labour to the epidemic is a serious concern. However, it was difficult to quantify the impact of the epidemic in terms of increasing costs.

In Namibia, worker-deficient households cultivate less land and have fewer cattle and less non-farm-related cash income (Mutangadura and Mukurazita, 1999).

2. *Absenteeism and loss of labour*

In countries or areas heavily affected by the HIV/AIDS epidemic, the time required to care for the sick and seek medical assistance often had an impact on time available for agricultural production. The outcome might be less timely farming practices, resulting in reduced yields and, over time, a general decline in household welfare.

A study conducted in Ethiopia showed the reduction in agricultural labour time as a result of HIV/AIDS: the number of hours per week in agriculture fell from 33.6 hours in non-afflicted households to between 11 and 16 hours in afflicted households (Black-Michaud, 1997).

AIDS is expected to have a greater impact in the future. According to estimates by FAO, between 1985 and 2000, in the 27 most affected countries in Africa, 7 million agricultural workers died from AIDS, and 16 million more deaths were likely to occur in the following two decades. In 12 countries, including the 10 most affected African countries, labour force decreases ranging from 10 to 26 percent are anticipated (table 15). Namibia is expected to suffer the most in terms of loss of labour force by 2020 (26 per cent of its labour force), followed by Botswana.

Another feature of the HIV/AIDS epidemic is that its impact may be observable only when the epidemic reaches the mortality stage of AIDS, with people dying in large numbers. It is therefore important to design measures that allow the prediction of the impact of the epidemic in the future as well as in the present. A study conducted by the United States Department of Agriculture addressed that concern by projecting the impact of AIDS on production (Shapouri and Rosen, 2001). The study found that in the most affected countries in Africa, slow growth in agricultural productivity and the overall economy resulted in growing food insecurity, with a substantial gap between production and needs projected for 2010 in many countries (table 16). Food insecurity is measured by the nutrition gap, which represents the difference between projected food supplies and the amount of food needed to meet per capita nutrition standards at the national level (United States Department of Agriculture, 2001). In Kenya, for example, grain production in 2010 is projected to be 12.1 per cent less than the amount needed (table 16). Increasing reliance on imported grain and food aid will be necessary to meet nutrition requirements (Shapouri and Rosen, 2001).

TABLE 15. ESTIMATED AND PROJECTED LOSS OF LABOUR FORCE IN 2000 AND 2020
(Percentage)

Country	*2000*	*2020*
Namibia	3.0	26.0
Botswana	6.6	23.2
Zimbabwe	9.6	22.7
Mozambique	2.3	20.0
South Africa	3.9	19.9
Kenya	3.9	16.8
Malawi	5.8	13.8
Uganda	12.8	13.7
United Republic of Tanzania	5.8	12.7
Central African Republic	6.3	12.6
Côte d'Ivoire	5.6	11.4
Cameroon	2.9	10.7

Source: FAO, "The impact of AIDS on food security", paper presented at the twenty-seventh session of the Committee on World Food Security, Rome, 28 May – 1 June 2001.

TABLE 16. GRAIN MARKET PERFORMANCE FOR SELECTED AFRICAN COUNTRIES

	Annual production growth		*Projected nutrition gap*[a]
	1980-1999	*1989-1999*	*2010*
		Percentage	
Eastern Africa			
Kenya	0.44	-1.04	12.1
Uganda	2.18	1.29	0.0
United Republic of Tanzania	2.03	0.00	33.6
Southern Africa			
Malawi	1.83	4.14	18.1
Zambia	-1.22	-3.63	69.9
Zimbabwe	-1.06	-0.10	2.4

Source: Based on S. Shapouri and S. Rosen, "Toll on agriculture from HIV/AIDS in sub-Saharan Africa", *Agriculture Information* Bulletin, No. 765-9 (June, 2001).
[a]As a percentage of grain production.

Outside of Africa, very few studies of the impact of HIV/AIDS on agriculture are currently available. This may be a result of the lower HIV prevalence in Asia and Latin America and the lower percentage of employment in the agricultural sector, which may lead to a lower impact. Nonetheless, it is still important to conduct studies in those regions to investigate the likely impact of HIV/AIDS on agriculture and the ways in which the social and physical environment may contribute to lessening the impact. For example, a study conducted in Thailand reached the conclusion that one third of the rural families affected by AIDS experienced a halving of their agriculture output (UNAIDS, 2000c).

Another study in Thailand of the impact of AIDS on rural families showed that the agricul-

Box. Key points on the socio-economic impact of HIV/AIDS on agriculture and rural development

The following factors should be borne in mind when analysing the impact of AIDS in rural areas:

- What distinguishes HIV/AIDS from other fatal diseases is that (a) **it primarily affects the most productive age group of men and women between 15 and 49 years**—the main breadwinners and heads of households raising families and supporting the elderly—**and their children**; (b) its full impact is revealed only gradually (given a median survival period of around 9 years in developing countries); and (c) there is no cure while drugs that can prolong life are not available to the large majority of infected people in developing countries.
- **The stigma attached to HIV/AIDS** is a distinguishing characteristic of the epidemic with adverse consequences for response measures. As a result of this stigma, it is more difficult to address HIV/AIDS than other diseases.
- **Countries in Southern and Eastern Africa have** increasing urban-to-rural equalization of HIV prevalence. Moreover, given the predominantly rural composition of many of these countries, in terms of absolute numbers, the number of people living with HIV/AIDS may be higher in rural than in urban areas.
- **The impact of HIV/AIDS is cross-sectoral and systemic.** Agriculture is a dynamic, integrated and interdependent system of productive and other components operating through a network of interrelated subsectors, institutions and rural households with linkages at every level of activity. The efficiency and effectiveness of each subsector, institution and household depends, to a large extent, on the capacity in other parts of the system. If this capacity is eroded through HIV, then the system's ability to function will be diminished.
- **The impact of HIV/AIDS on agricultural production systems and rural livelihoods** must be disaggregated into its spatial and temporal dimensions. Geographic and ethnic factors, gender, age, agro-ecological conditions and livelihood strategies play a role on the impact of HIV/AIDS on agricultural production and livelihood systems.
- **HIV/AIDS disproportionately affects sectors that are highly labour-intensive** or have large numbers of mobile or migratory workers, including agriculture, transportation and mining.
- The magnitude of the epidemic is such that one can no longer categorize households as afflicted, affected and unaffected. **Nearly all households within a community are likely to be directly or indirectly impacted by the epidemic**.
- It has been argued that **those rural people whose activities are not counted by standard measurements of economic performance and productivity are among the most vulnerable to the impact of HIV/AIDS**. The effects of the epidemic on the resources, time and labour of those working in subsistence agriculture, in rural households (particularly women) and in the informal sector are for the most part invisible in quantitative terms.
- **The cost of HIV/AIDS is largely borne by rural communities.** Many HIV-infected urban dwellers return to their village of origin when they fall ill. Rural households (particularly women) provide most of the care for AIDS patients. In addition, food, medical care costs and funeral expenses are primarily borne by rural families.
- **The burden of the socio-economic impact of HIV/AIDS disproportionately affects rural women**. Widows tend to become poorer as they lose access to land, property, inputs, credit and support services. HIV/AIDS stigmatization compounds their situation further, as assistance from the extended family and the community—their only safety net—is often severed. Widowers tend to remarry soon after losing their wives, thus cushioning their families from AIDS impacts.
- **The impact of HIV/AIDS on children is severe** as widespread orphanhood and fosterage are bringing the coping mechanisms of many extended families to the breaking point. Withdrawal from school, a decrease in food intake, a decline in inherited assets and less attention from caretakers are among the adverse effects of the epidemic on children.

Excerpt from D. Topouzis, *Addressing the Impact of HIV/AIDS on Ministries of Agriculture: Focus on Eastern and Southern Africa* (Rome, FAO; and Geneva, UNAIDS, 2003).

tural families and the poorest families in the northern provinces of Thailand, where more AIDS cases were found, were also the most vulnerable to the economic impact on agriculture. The study found that the economic impact of an adult AIDS death was sizeable despite all the coping strategies employed. The least able to cope were the poorest and the least educated agricultural workers (Pitayanon, Kongsin and Janjaroen, 1997).

3. *Gender implications*

HIV/AIDS frequently has severe consequences for rural widows of AIDS victims. In sub-Saharan Africa and Asia, women contribute to more than half the food production and are usually involved in the most labour-intensive farming activities (UNAIDS, 2002). However, in areas where women are not permitted to inherit property, they may lose access to land and other assets when their husband dies (FAO and UNAIDS, 2003). In some cases, the cultural division of labour makes it impossible for women to assume the farming tasks previously performed by their husbands, and they are forced to abandon farming. Inequality in access to credit, employment, education and information all make women more vulnerable to the negative impacts of HIV/AIDS (Stokes, 2003). Moreover, the stigma of the disease may inhibit widows from seeking community and extended-family support, which are vital safety nets in rural areas.

C. CONCLUSIONS

The evidence with respect to the impact of HIV/AIDS on agriculture remains scattered and incomplete. Most studies cover small areas, and many do not include a control or comparison group of households not affected by HIV/AIDS. Moreover, little is known about the effects of the epidemic over time. Nonetheless, the current evidence demonstrates that HIV/AIDS is having a crushing effect on agricultural production and the economic viability of AIDS-affected households in diverse areas of Africa. HIV/AIDS is also having a serious impact on commercial agricultural enterprises.

The future impact of HIV/AIDS on agriculture will depend, among other things, on finding ways to reduce the amount of labour required, including introducing less labour-intensive methods of production and increasing yields with non-labour inputs. In many of the countries most affected by HIV/AIDS, the agriculture sector was already under stress from desertification and government neglect of the traditional farming sector. The epidemic is intensifying labour shortages, increasing malnutrition and adding to the burden of rural women, especially those who head farm households.

The major findings of the chapter are as follows:

- **The HIV/AIDS epidemic has led to significant reductions in food production in AIDS-affected households.** In two villages in Burkina Faso, for example, revenues from agricultural production declined by 25-50 per cent as a result of AIDS. The Government of Swaziland reported a 54 per cent drop in agricultural production in AIDS-affected households.

- **HIV/AIDS has caused a decline in the supply of labour for food and livestock production.** The decline is caused by the illness and deaths of people living with AIDS and by the time spent by household members in caring for sick relatives. In the United Republic of Tanzania, for example, a study found that a woman whose husband was sick spent 45 per cent less time on agricultural tasks than a woman whose husband was healthy. Even larger declines have been documented for Ethiopia.

- **HIV/AIDS has caused shifts of production from cash crops to food crops in AIDS-affected households.** The change has resulted in lower household incomes and a lack of funds to buy non-food essentials or non-labour inputs necessary to maintain agricultural yields.

- **The HIV/AIDS epidemic is leading to a loss of knowledge about farming methods and a reduction in skilled and experienced labour.** As documented, for example, in Kenya, farmers who die of AIDS do not live long enough to pass on their know-how to subsequent generations.

VI. IMPACT ON EDUCATION

Like every other sector of the social and economic life of an AIDS-afflicted country, the education sector has felt the impact of the HIV/AIDS epidemic. An increasing number of countries in sub-Saharan Africa face a shortage of teachers. Deaths and illnesses have also affected education sector administrators, planning and finance officials. At the same time, children in AIDS-affected households are delaying school entry or dropping out of school. Hence, the HIV/AIDS epidemic is seriously threatening the achievement of the goals of the Dakar Framework for Action, adopted by the international community at the World Education Forum, held in Dakar, Senegal in April 2000, and of the Millennium Development Goals.

Education is a major engine of economic and social development. The expansion of educational systems became a high priority for many Governments in the decades following the Second World War, as evidence accumulated that investment in human capital, particularly health and education, had important economic benefits for the whole society. Between 1970 and 2000, the percentage of the population aged 15 and over who had completed primary school increased from 23 to 43 per cent in 73 developing countries (as estimated by Barro and Lee, 2000). Improvement in sub-Saharan African countries, however, lagged behind that of most other regions. In 1970, only 16 per cent of the adult population in 22 sub-Saharan African countries had completed primary school or more, and that figure had increased to only 28 per cent by 2000. Most of the improvement occurred in the 1970s. In the 1980s, poorly performing economies resulted in no overall gain in enrolments during that decade and even led to declines in some countries. Although there is substantial variation among sub-Saharan countries, progress in educational attainment for the region was slow even before the HIV/AIDS epidemic became established. With the added burdens and costs of the disease, the task of maintaining the educational system and making it accessible to all children is daunting.

Chapter VI examines the impact of the HIV/AIDS epidemic on the supply of education, the demand for education and the quality of education. The first section proposes a conceptual framework for the impact of HIV/AIDS on education, mapping the processes through which the education sector is affected. It is followed by an examination of the available evidence of the impact of the AIDS epidemic on education. The final section presents the conclusions.

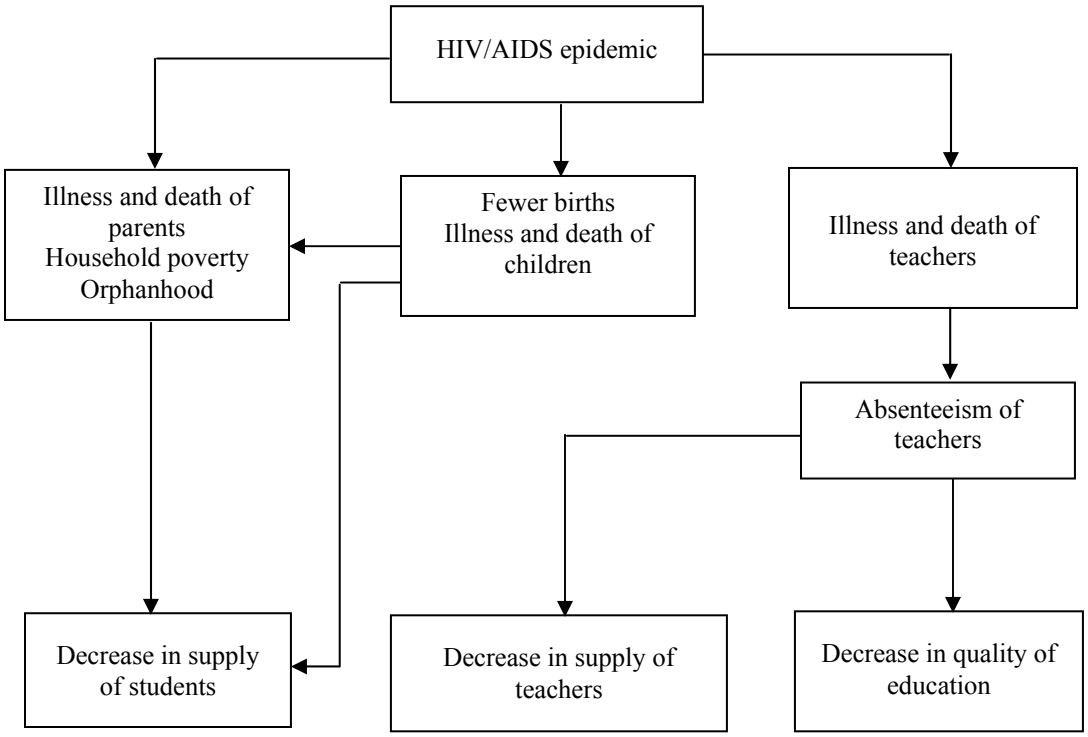
A. Conceptual framework for the impact of HIV/AIDS on education

The HIV/AIDS epidemic may affect the education sector in at least three ways (figure 11): the supply of education through the availability of teachers, the demand for education (total number of children and the number enrolled and staying in school) and the quality of education (supply of experienced teachers). In sum, as a result of HIV/AIDS, fewer children are able to enrol in school and receive the basic skills and knowledge they need, fewer teachers are available to teach them and the quality of the education they receive is consequently diminished.

The absenteeism of teachers from school and ultimately their deaths affect the teaching resources available. Teachers who are infected with the HIV virus may try to transfer to another area or, once visibly ill, may disappear (Katahoire, 1993). Other teachers may also want to transfer out of heavily affected areas or may refuse to be posted to them, thus decreasing the number of teachers available in the region.

The deaths of children or parents will affect school enrolment, as a smaller number of children will be entering the school system and more children will be dropping out of school to take care of sick parents or siblings after the death of their parents. The number of children entering the school system will diminish if AIDS orphans do not enrol, delay enrolling or leave school in large numbers.

Figure 11. Conceptual framework for the impact of the HIV/AIDS epidemic on education



Source: United Nations, Department of Economic and Social Affairs, Population Division.

Some school-aged children may be infected with HIV/AIDS or suffer from AIDS-related illnesses. Such illnesses may cause them to be absent from school frequently, and they may interfere with their ability to learn and their academic performance. Children who acquire the HIV virus from their mothers during childbirth or breastfeeding usually do not survive long enough to enrol in school.

Equally important is the possible decrease in the quality of education, as teachers may be absent from school or too ill to provide the same quality of schooling they were providing before becoming sick. The quality of education may also decrease if less money is invested in the education sector as countries with a high prevalence of HIV/AIDS struggle to fight the epidemic.

The HIV/AIDS epidemic may also affect education resources owing to the costs that it imposes on the system. In order to compensate for the loss of teachers, schools may hire temporary staff at the same time that the costs of employee benefits, recruitment and training are rising. In some countries, employee benefits may be paid to teachers until they die. Hence, the education system may continue to pay a large number of non-working persons in addition to covering the financial costs of replacements.

Over time, as teachers fall victim to AIDS and the costs of training new staff mount, the school system may rely more and more on less qualified teachers with less experience, resulting in a decrease in the quality of education.

Another possible impact of HIV/AIDS on the quality of education is its effect on students as they witness the absenteeism and the deaths of their teachers. In remote rural areas, where teachers provide a role model, school children may view the disappearance of their teachers as their own destiny if they pursue schooling. Even teach-

ers who are not infected with the HIV virus may be deeply affected personally by the prevalence of HIV/AIDS among their relatives and colleagues.

B. Available evidence on the impact of HIV/AIDS on education

Many studies have been conducted to estimate and predict the impact of AIDS on education. Studies undertaken under the auspices of the United Nations Children's Fund reached the conclusion that as a result of AIDS, many countries will be facing a shortage of teachers in the near future. For instance, a study conducted in Zambia showed that of about 1.7 million primary school students, approximately 56,000 lost a teacher to AIDS in 1999. The study also found that the number of teacher deaths in 1998 was equivalent to the loss of about two thirds of the annual output of newly trained teachers (UNICEF, 2000).

The same UNICEF study found that 860,000 children lost a teacher to AIDS in sub-Saharan Africa in 1999. The largest numbers of children affected were in South Africa, Kenya, Zimbabwe and Nigeria (table 17). In Malawi, 10 per cent of education personnel in urban areas were estimated to have died of AIDS by 1997, and by 2005 it is projected that this figure will increase to 40 per cent (World Bank, 1998).

In the South African province of KwaZulu Natal, where HIV/AIDS prevalence is the highest in the country, a random sample of 100 schools found that the mortality of teachers rose significantly, from 406 in 1997 to 609 in 2001 (Badcock-Walters and others, 2003).

The HIV/AIDS epidemic will have a negative impact on the learning process in school through increased absenteeism. An empirical research study found that each infected teacher will lose, on average, six months of professional time before developing full-blown AIDS and an additional 12 months after developing full blown-AIDS (Tarfica, 2000).

Evidence is available on the impact of HIV/AIDS on school enrolment. For example, focus group discussions with AIDS-affected households found that those households were unable to meet the costs of children's education as a result of AIDS. Furthermore, an analysis of 49 case studies of families affected by AIDS throughout Zambia found that 56 of 215 children had been forced to leave school (Haworth and others, 1991).

In the Rakai district of Uganda, a study found that total enrolments in three primary schools went from 1,534 in 1989 to 950 in 1993, a 40 per cent drop in a four-year period. The primary school dropout rate for the district was 27 per cent in 1993 compared to 15 per cent at the national level (Katahoire, 1993). Another study conducted in Uganda found that of about 5 million school students, 81,000 were estimated to have lost a teacher to AIDS in 1999 (UNICEF, 2000). In the same country, a household survey in the capital city of Kampala found that 47 per cent of households with orphans did not have enough money to send children to school, compared with 10 per cent in non-orphan households (Muller and Abba, 1990).

The impact of the HIV/AIDS epidemic on the number of school-aged children is dramatic. In Zambia, projections yield a population aged 15 and below at 5.8 million by 2010, 1.4 million less than it would have been in the absence of AIDS (Hunter and Fall, 1998). Ironically, according to the authors, "with between 750,000 and one million fewer than expected children of primary school age, Zambia's goal of achieving universal primary education would become easier to reach". Unfortunately, the goal will be achieved at very high human and other costs (Kelly, 2000). It is important to point out that in most countries affected by the HIV/AIDS epidemic, the school-age population is projected to continue to grow in spite of HIV/AIDS. Nevertheless, in a few countries, some projections show that the population aged 15 years old and under in 2010 will be smaller than it was in 2000.

A number of studies have documented the income effect of AIDS on school attendance. For example, a World Bank study reported that in the United Republic of Tanzania, school attendance by students 15-20 years old was cut in half in households that lost an adult female (World Bank, 1995). Another study from Zimbabwe found that

TABLE 17. NUMBER OF PRIMARY SCHOOLCHILDREN WHO LOST A TEACHER TO AIDS, 1999

Country	*Number of children who lost their teachers to AIDS*
South Africa	100 000
Kenya	95 000
Zimbabwe	86 000
Nigeria	85 000
Uganda	81 000
Zambia	56 000
Malawi	52 000
Ethiopia	51 000
United Republic of Tanzania	49 000
Democratic Republic of Congo	27 000

Source: UNICEF, *The Progress of Nations, 2000* (New York, 2000).

31 per cent of the households interviewed had a child who was not attending school following the death of the mother (Mutangadura, 2000). That result was confirmed by another study in Zambia, which found that 55 per cent of AIDS-affected households in the Mansa district were unable to meet the costs of their children's education owing to AIDS (Kasawa, 1993).

Several studies have examined the difference in school enrolments between children who lost one or both parents and children whose parents were alive (see chapter III). Using Demographic and Health Survey data from Ghana, Kenya, the Niger, the United Republic of Tanzania and Zimbabwe, Bicego, Rutstein and Johnson (2003) found that double orphans aged 6-10 were only half as likely as non-orphans to be in the appropriate grade and that double orphans 11-14 were two thirds as likely. Case, Paxson and Ableidinger (2003) used DHS data from 10 countries; their results showed that double orphans in most countries were 10 to 30 percentage points less likely to be in school. A study of orphans in the United Republic of Tanzania found that orphanhood lowered the odds of attending school by 45 to 64 per cent (Suliman, 2003). Moreover, orphans were more likely to drop out of school and more likely to work while attending school than non-orphans. Orphans were found to have lower school attendance in 44 countries for which information was available by mid-2003. Not only were orphans less likely to be attending school than children with both parents alive, but in countries with trend data, the gap was widening.

In Zambia, some evidence from microstudies shows that 44 per cent of children of school age were not attending school in the Copperbelt region, with proportionately more orphans (53.6 per cent) than non-orphans (42.4 per cent) not attending (Rossi and Reijer, 1995).

A study conducted on the impact of AIDS on the education sector in Botswana, Malawi and Uganda found country-specific results. For example, in Botswana, a country with one of the highest HIV prevalence rates, absenteeism of school children was very low and orphans had better attendance records than non-orphans, whereas in Uganda and Malawi, absenteeism was somewhat higher among orphans than among non-orphans (Bennel, Hyde and Swainson, 2002). The authors state that Botswana has a strong schooling culture and most children attend primary and junior secondary school. Moreover, household demand for child labour is low, and schools provide meals, a major incentive for disadvantaged children. In addition, the Government of Botswana has introduced a national programme of targeted support

for orphans. In Malawi and Uganda, which are more typical low-income countries, absenteeism is generally high among all schoolchildren, partly because of widespread poverty. School fees and the cost of uniforms were given as reasons for absenteeism of secondary school students in Malawi and Uganda.

Children who had lost a parent to AIDS were 50 per cent less likely to receive an education, and children who had lost both parents were 90 per cent less likely to be educated in Burkina Faso in 1998-1999, whereas children in eastern Zimbabwe who had lost their mother were less likely to have completed primary school than children who had lost their father or children whose parents were living (Nyamukapa, Gregson and Wambe, 2003).

C. CONCLUSIONS

AIDS is degrading the supply and quality of education and may disrupt schooling for a whole generation of children. In the long run, the diminished investment in human capital may delay social and economic development. The major findings of the present chapter are as follows:

- **The HIV/AIDS epidemic is eroding and even reversing progress made in achieving universal primary education**.

- **HIV/AIDS reduces the supply of educational services as a result of teacher attrition and absenteeism.** Studies predict teacher shortages in many countries, including Kenya, Malawi, Nigeria, South Africa, Zambia and Zimbabwe.

- **The AIDS epidemic imposes higher costs on the educational system** for medical care and death benefits for afflicted teachers and for recruiting and training replacements for teachers lost to AIDS.

- **HIV/AIDS reduces the number of school-aged children.** When children are born with the virus, they rarely live long enough to attend school.

- **Children orphaned by AIDS are less likely to be enrolled or attend schools than non-orphans.** Children whose parents are ill or die of AIDS drop out of school to provide care or help with economic activities, and households with an AIDS victim may no longer be able to afford school fees for their children. Studies in sub-Saharan African countries found significantly lower enrolment rates among children who had lost both parents than among children whose parents were both alive and who were living with at least one biological parent.

- **HIV/AIDS erodes the quality of education.** Infected teachers may be absent or too ill to provide a good education for their students, and substitute teachers may have neither the qualifications nor the experience to replace them. Quality of education may also suffer if investment in the education sector declines as funds are diverted to fight the HIV/AIDS epidemic.

VII. IMPACT ON THE HEALTH SECTOR

The HIV/AIDS epidemic has posed and will continue to pose tremendous challenges to the health systems of the developing countries, especially in the most severely affected countries. HIV/AIDS increases overall health expenditures for both medical care and social support at the same time that it is claiming the lives of doctors and nurses in the developing countries. The present chapter presents a conceptual framework for the impact of HIV/AIDS on the health sector. It then reviews some of the empirical findings concerning the effects of HIV/AIDS on the health sector.

A. Conceptual framework for the impact of HIV/AIDS on the health sector

HIV/AIDS may affect the health sector in a number of different ways, as shown in figure 12.

- First, health workers themselves may be infected with the HIV virus, and this will affect the supply of public health services. Health workers are vulnerable to the same routes of infection as the general public; however, they may also contract the HIV virus or other infections associated with AIDS, such as tuberculosis, through contact with AIDS patients.

- The morale of the health professionals may also be affected. Caring for AIDS patients is demanding and stressful for the health staff involved. High levels of stress may lead to greater staff absenteeism, and staff may refuse to be transferred to high-prevalence regions within a country.

- In some cases the quality of services may also be affected by the attitude of the health staff towards HIV/AIDS patients. Fear of contracting the disease and the psychological stress involved in treating AIDS patients may lead to a reduction in the quality of services provided.

- HIV/AIDS contributes to increases in health expenditures in both the public and private sectors and may divert resources towards the higher levels of care needed for AIDS patients.

- The added strains on public health finances, staff and other resources may force more people to seek private health care. Many households may have to choose between health care and other essentials such as food.

B. Available evidence on the impact of HIV/AIDS on the health sector

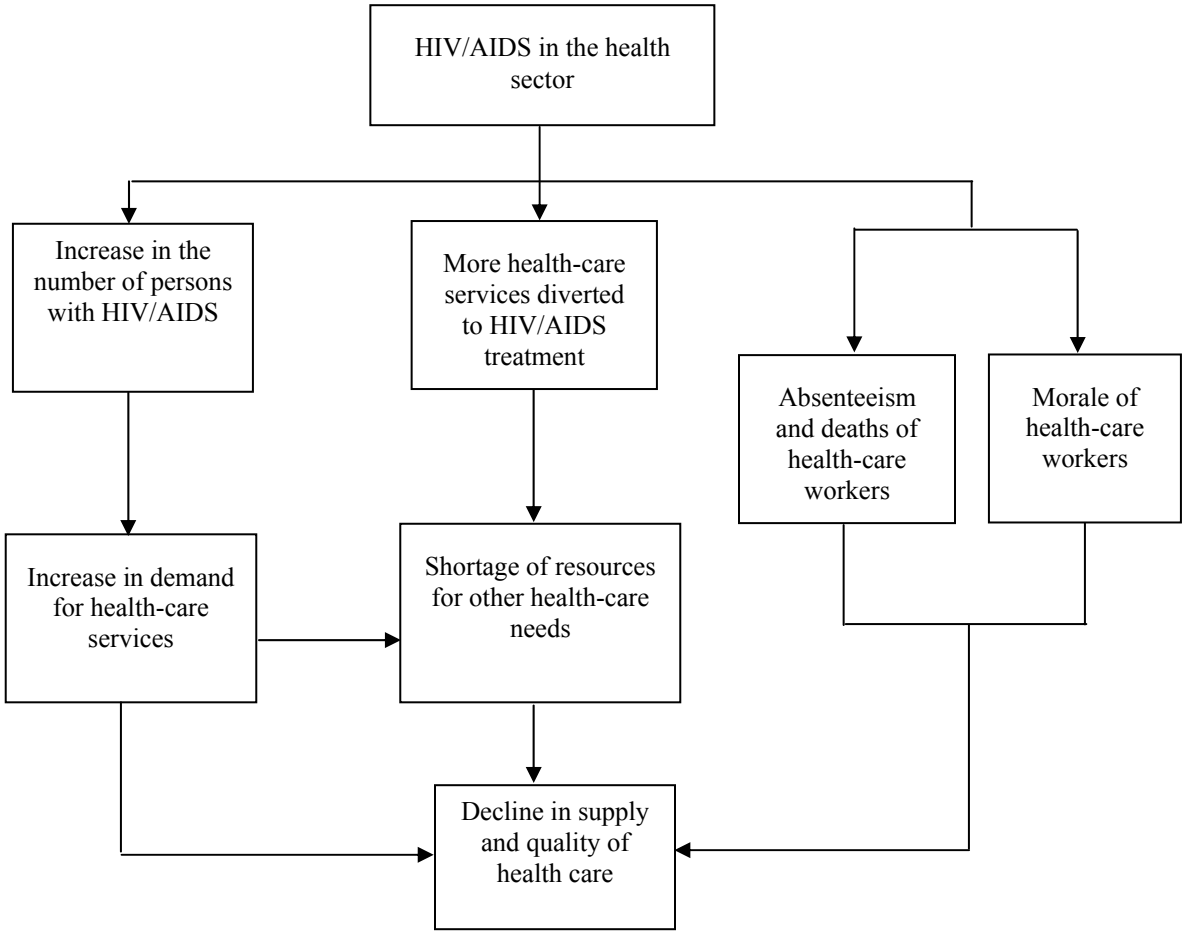
Increases in the number of people seeking health care are straining the health sector in the developing countries most affected by HIV/AIDS. The health systems of those countries were struggling to cope with pressing health-care needs even before the HIV/AIDS epidemic.

1. *Shortage of health professionals*

The World Bank has estimated that a country with a stable 5 per cent adult HIV prevalence rate can expect that each year between 0.5 and 1 per cent of its health-care providers will die from AIDS. In contrast, a country with 30 per cent prevalence would lose 3-7 per cent of its health workers to the HIV/AIDS epidemic (World Bank, 1999).

Absenteeism and illness among health workers is a major issue. In Lusaka, Zambia, for example, HIV prevalence was 39 per cent among midwives and 44 per cent among nurses in 1991-1992 (Whiteside, 2002). Health workers are also susceptible to opportunistic infections that often accompany HIV/AIDS. Studies conducted in South Africa between 1991 and 1998 documented a five-fold increase in the tuberculosis rate among

Figure 12. Conceptual framework for the impact of the HIV/AIDS epidemic on the health sector



Source: United Nations, Department of Economic and Social Affairs, Population Division.

staff. In Zambia, pilot surveys found that mortality among nurses had increased 13-fold between 1980 and 1991, to 2.7 per cent (Buvé and others, 1994).

The quality of care of AIDS patients may also suffer because caregivers fear contracting the disease. In Burkina Faso, a study found that health-care workers were afraid of contracting the HIV virus and that their fear had led to a decline in the quality of care (Burkina Faso National Committee to Combat HIV/AIDS and Sexually Transmitted Infections, 2003).

2. *Increased demand for health care*

Many countries in the developing world are faced with a high demand for treatment of AIDS-related diseases, making it difficult to satisfy the demand for treatment of other diseases. Information on bed usage by AIDS patients is available for major hospitals in a number of countries. For

many of the most affected countries, the loss of hospital capacity may be on the order of 50 per cent.

A study conducted in Rwanda found that 350 HIV-positive outpatients visited the hospital 10.9 times on average as opposed to 0.3 times for the general population. The study also revealed that the increased demand for outpatient services was characterized by considerable inequities. Expenditures on health services differed according to gender, income, place of residence and the ability to mobilize non-household resources to pay for care (Nandakumar, Schneider and Butera, 2000).

3. *Increases in health expenditures*

Calculations by the World Bank (1999) suggest that the effect of HIV/AIDS on total health care costs is likely to be quite large, even in countries that are spared the most serious epidemics. As HIV/AIDS increases the demand for health care, it will tend to drive up the effective price of health care as well, amplifying the impact on total health-care spending. Higher prices will lead some people to forego care they would have sought at the lower price, with the poor likely to feel the greatest effect. However, the price-responsiveness or elasticity of demand for adult health care is usually small, since people who are sick and who have the ability to pay will often pay whatever is needed to get well (World Bank, 1999, p. 191). The same publication considers a hypothetical country in which the HIV/AIDS epidemic would level off at a constant seroprevalence of 5 per cent of the adult population. Using plausible assumptions about the elasticities of demand and supply for health care (based on observed patterns in selected countries), assuming that the Government would subsidize the cost to consumers and assuming that adult mortality in the absence of HIV/AIDS would match conditions in sub-Saharan Africa before the epidemic, the World Bank estimated that HIV/AIDS among adults would increase health care expenditures by over 40 per cent, even in the absence of anti-retroviral therapy. Factoring in the cost of anti-retroviral therapy and the cost of care for children with AIDS would raise the total cost. Finally, the total cost will be much larger where HIV seroprevalence rises substantially above 5 per cent of the adult population.

In sub-Saharan Africa, the annual direct medical costs of AIDS (excluding anti-retroviral therapy) are estimated at $30 per person infected, whereas the overall health expenditures in the public health sector are less than $10 per capita in most African countries (UNAIDS, 2002a). In many low-income countries, public health budgets are too low to provide basic health-care services, even without the added burden imposed by AIDS (Musgrove and Zeramdini, 2001).

In studies conducted in Côte d'Ivoire, Mexico and the United Republic of Tanzania, health expenditures have increased drastically during the last two decades. In many affected countries, the health budget allocated to the HIV/AIDS epidemic has increased, leading to the compression of the non-AIDS health budget (Shepard, 1998).

One of the reasons for a higher allocation to AIDS in the health budget is that AIDS is far more costly to treat than other conditions. A study in Zimbabwe shows, for instance, that hospital care for HIV/AIDS patients was twice as expensive as that for the non-HIV/AIDS patients. In Côte d'Ivoire, 906 AIDS patients who went to private clinics spent a total of 2,516,709 CFA francs (CFAF) in 1996, whereas 8,699 patients who went to public health facilities spent 4,735,000 CFAF (Koné and others, 1998). The Government allocated a budget of 470 million CFAF for the fight against HIV/AIDS, but only 60 per cent of the budget was made available. Of the total of 1.5 billion CFAF spent in 1994-1995 by the public health sector, only 18 per cent came from government funds. Total government expenditures for 1995 were 50 billion CFA ($100 million), of which three quarters was spent on curative care and one quarter on prevention. AIDS expenditures represented 8.5 per cent of total health spending.

In Mexico, the Government spent $79 million on AIDS-related health care and prevention in 1995, or about 1 per cent of its total (private and

public) health expenditures. HIV prevalence is low in Mexico, which explains the relatively low proportion of HIV/AIDS-related expenditures in the total health expenditures (Izazola and others, 1998).

In the United Republic of Tanzania, where adult HIV prevalence is higher than in either Mexico or Côte d'Ivoire, HIV/AIDS health expenditures are higher. As a result of the large share of prevention interventions financed by donors and the large amount spent, donors funded a third of all health spending in the United Republic of Tanzania and 84 per cent of all spending on HIV/AIDS and sexually transmitted diseases in 1996—a larger share in both cases than that of the Government. The contribution of Government to health and HIV/AIDS/STD spending is therefore very small—19 per cent of total health spending and 5 per cent of spending on HIV/AIDS and STDs (Tibandebage and others**,** 1998).

A few studies have documented how the costs of treatment are shared between service providers in the public sector, private clinics and households. In developing countries, there seems to be a shift of the burden of treatment towards households. The household out-of-pocket share of total health-care spending tends to be higher in low-income than in middle- or high-income countries (Musgrove and Zeramdini, 2001). The epidemic has triggered an increase in private health spending which, for many affected households, has influenced the consumption of basic items (see chapter III). The "care gap" is now being partially filled by local, non-governmental service organizations as well as the traditional network of extended family.

Highly active anti-retroviral treatment for AIDS has been available on only a limited basis in low-income countries, but this is beginning to change with the establishment of differential pricing schemes for the drugs. In early 2000, the annual cost of the drugs for treating one person was from $10,000 to $12,000 nearly everywhere, but by the end of 2001 prices as low as $350 were being offered in some cases (UNAIDS, 2002). Such prices will mean that many more people can be treated. However, low-income countries with high HIV prevalence cannot be expected to meet, out of their own resources, the cost of extending treatment to all who need it.

The international community has recognized that low-income countries need donor assistance to cope with the costs of prevention and treatment of HIV and AIDS. Experts associated with UNAIDS estimated that, as of 2001, annual spending on HIV/AIDS in low- and middle-income countries from all sources was $1.8 billion, but that annual resource needs amounted to $3.2 billion in 2002 and would rise to $9.2 billion by 2005. Of the total for 2005, $4.8 billion is estimated to be needed for prevention interventions and $4.4 billion for care and support, of which $2.2 billion would be needed for anti-retroviral treatment (Schwartländer and others, 2001). While the estimates include an allowance for non-medical support to orphaned children, they do not include the costs of the improvements to the health infrastructure that will be required to expand delivery of services. It was estimated that one third to one half of the needed resources could come from the public and private sectors of the countries themselves, but that international donors would need to provide the remainder.

4. *Health as a human capital investment*

Investment in human capital is one of the most important aspects of development and economic growth. Along with education, good health is an element of human capital and is an essential ingredient for a productive population. The education sector adds value to human capital, whereas the health sector maintains it (Whiteside, 2002). The HIV/AIDS epidemic has changed the equation for investment in human capital: if mortality rates are high, especially among young adults, then there is a substantial decrease in lifetime returns to human capital investments (United Nations, 2003e). Moreover, as costs of care for AIDS patients increasingly strain public spending on health care, the health needs of other individuals may receive less attention. The reallocation of scarce resources could compromise the health status of the whole population and retard economic growth. A study in Burkina Faso found that the increase in resources allocated to HIV/AIDS treatment resulted in a reduction in the resources available to combat other health concerns, such as

malnutrition, malaria and tuberculosis (Burkina Faso National Committee to Combat HIV/AIDS and Sexually Transmitted Infections, 2003).

The HIV/AIDS epidemic is also affecting the human capital investment in children whose parents have died of AIDS. Several studies have found that orphans are more likely to be living in poor households than non-orphans and are less likely to be enrolled in school (Bicego, Rutstein and Johnson, 2003; Case, Paxson and Ableidinger, 2003; Suliman, 2003; see also chapter III on households and chapter VI on education). In addition, the health and nutritional status of orphans is also likely to suffer. Children in rural Uganda who had lost a parent to AIDS had higher HIV-1 seropositivity rates than those whose parents were not infected (Busingye and others, 2003). Floyd and others (2003) found that children of AIDS victims in the Karonga district of Malawi had higher mortality rates than other children. In a study of 312 communities in 13 Indonesian provinces, Gertler, Levine and Martinez (2003) found that children whose mothers had died were more likely to die than children who had not lost a parent. Bereaved children were generally less healthy than children whose parents had lived.

In a study of children's health in the northwestern United Republic of Tanzania, Ainsworth and Semali (2000) found that adult deaths led to increased morbidity and reduced height for age of children under five in the household. The effects were most severe for children from the poorest households, those whose parents were uneducated and those with the least access to health care.

C. Conclusions

Developed countries generally, albeit with difficulty, have been able to cope with burdens on the public health sector caused by HIV/AIDS. However, in the less developed countries, especially in the most affected ones, the total effects on the health sector are already serious and are projected to increase sharply as the number of AIDS cases grows. Increased need for health-care services, together with an eroding supply of health-care workers, risks degrading the quality and quantity of health care for whole populations.

Some of the major conclusions of the present chapter may be summarized as follows:

- **Absenteeism and deaths of health workers pose a serious threat to the health systems of the most affected countries**. A shortage of nurses and doctors has been observed in the high HIV prevalence countries. The shortage is particularly pronounced in rural areas since many health professionals are unwilling to work in remote areas.

- **The increasing mortality of health professionals in some countries poses a serious threat to the quality of health care**. Training of new professionals is certainly going to cost more money, while the accumulated experience of those who died is lost forever.

- **The budget devoted to health in most developing countries is insufficient to cover AIDS-related expenditures.** With more people falling ill and with the demand for anti-retroviral therapy growing, the budgetary situation can only get worse. Since the treatment of AIDS is expensive, few public health sectors in the developing world can afford it. Thus, there is a shift of the costs to the private sector and to households.

- **The high demand for an effective treatment of AIDS-related diseases makes it difficult for the most affected countries to satisfy the demand for treatment of non-HIV/AIDS-related diseases.** Funds for treatment of malaria and tuberculosis, for example, have been diverted to care for AIDS patients.

- **Developing countries need help from international donors if they are to meet the health-care needs imposed by HIV and AIDS.** The Joint United Nations Programme on HIV/AIDS has estimated that, as of 2001, annual

spending on HIV/AIDS in low- and middle-income countries from all sources was $1.8 billion, but that annual resource needs amounted to $3.2 billion in 2002 and will rise to $9.2 billion by 2005. While the countries involved might be able to provide one third to one half of the needed resources, the international community will need to provide the remainder.

VIII. IMPACT ON ECONOMIC GROWTH

The impact of the HIV/AIDS epidemic on the economy has been a concern since the beginning of the pandemic. Some believe that the HIV/AIDS epidemic is responsible for slowing the rate of growth of the gross national product of many heavily affected countries and that in some cases, GNP growth could decrease by more than 1 percentage point for every 10 per cent HIV prevalence. Others take the view that HIV/AIDS has had little impact on the macroeconomy so far. It is difficult to estimate empirically the effect of HIV/AIDS on economic performance since so many factors other than HIV/AIDS affect economic growth. The countries most seriously affected by the epidemic are also faced with drought, war and other problems.

Development, as set out in the Declaration on the Right to Development (General Assembly resolution 41/128, annex), "is a comprehensive economic, social, cultural and political process, which aims at the constant improvement of the well-being of the entire population and of all individuals on the basis of their active, free and meaningful participation". While economic growth is an important element of the development process, it is not by itself an adequate yardstick of development. A fuller understanding of the effects of HIV/AIDS on the prospects for development requires looking beyond the conventional indicators of macroeconomic performance.

In the first section, the present chapter presents an analytic framework based on previous studies of the impact of HIV/AIDS on the economy. The second section outlines approaches to estimating the effects of HIV/AIDS and the third section examines the currently available evidence on the impact of HIV/AIDS on economic growth rates, including the uncertainties associated with those estimates, and also briefly reviews attempts to address impacts on broader indicators of welfare and development. The final section summarizes the current state of knowledge regarding the effects of HIV/AIDS on the macroeconomy.

A. CONCEPTUAL FRAMEWORK FOR THE IMPACT OF HIV/AIDS ON ECONOMIC GROWTH

The HIV/AIDS epidemic can affect the economy in a number of ways:

- The AIDS epidemic will slow or reverse growth in the labour supply. The economic impact can vary according to the sector of the economy, the degree to which HIV/AIDS affects hard-to-replace skilled labour and whether or not there is a substantial pool of "surplus labour".

- Savings and investments of families will be reduced owing to the increase in HIV/AIDS-related health expenditures. If children's education, health and nutrition suffer as a result, prospects for longer-run economic growth and development will decline.

- The AIDS epidemic may also divert public spending from investments in physical and human capital to health expenditures, leading over time to slower growth of the gross domestic product. Foreign and domestic private investment might also decline if potential investors become convinced that the epidemic is seriously undermining the rate of return to investment.

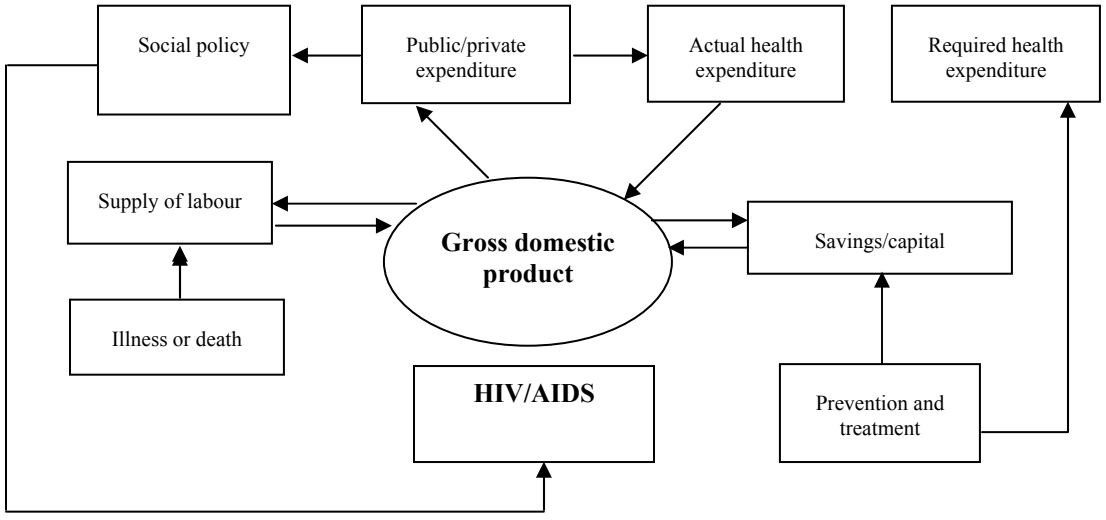
- The HIV/AIDS epidemic may also deepen the poverty of the most affected countries by decreasing the growth rate of per capita income and by selectively impoverishing the individuals and families that are directly affected.

Cohen (1997), among others, stresses the effect of HIV on the size of the working population, which tends to reduce total output and worsen the dependency ratio. More children and elderly peo-

ple may have to be supported by a smaller active labour force. In addition, the composition of the labour force may change with respect to skills, education and experience, which would decrease the productivity of labour.

Theodore (2001), in a model applied to several Caribbean countries, identified four channels through which HIV/AIDS may affect the economy: the production channel; the allocation channel; the distribution channel; and the regeneration channel (figure 13). The production channel refers to the mechanisms through which HIV/AIDS affects the main factors of production—labour and capital—causing the production process to be less fruitful than it would have been in the absence of HIV/AIDS. The second channel through which HIV/AIDS may affect the economy is the allocation channel. One of the most important functions of the economic system is to ensure an efficient allocation of resources. HIV/AIDS reroutes some of those resources to medical expenses and away from other productive uses. The third assumed channel through which HIV/AIDS affects the economy is the distribution channel, specifically, the distribution of income. In the face of an epidemic that increases health expenditures and weakens the income base, the lowest income groups may fare the worst. While the rich may have other assets—savings, land or capital—often the only productive asset of the poor is their own labour, which HIV/AIDS attacks. The upper income groups, though they are also affected, may be better placed to protect themselves and better able to afford treatment. Thus, the HIV/AIDS epidemic has the potential not only to affect all groups but also to widen the gap between different social strata. The fourth channel, the regeneration channel, refers to the investments in human capital, physical capital and new technology that are needed to keep the economy growing. If the HIV/AIDS epidemic compromises the saving capacity and the human capital of the economy, it will undercut the process of economic development.

Figure 13. Conceptual framework for the impact of HIV/AIDS on the economy



Source: Karl Theodore, "HIV/AIDS in the Caribbean: economic issues—impact and investment response". Commission on Macroeconomics and Health Working Paper Series, Paper No. WG1:1 (Cambridge, Massachusetts, Harvard University, Center for International Developments; and Geneva, World Health Organization, 2001).

B. Approaches to estimating the effects of HIV/AIDS

A variety of economic modelling approaches have been employed to estimate the macroeconomic effects of the HIV/AIDS epidemic. In general, the task is to estimate how the economy would have performed in the absence of AIDS and contrast that result with an estimate of economic performance, given the estimated or projected number of HIV/AIDS cases. The economic outcome studied is typically growth in total gross domestic product per capita and/or growth in total GDP. Sometimes intermediate outcomes, such as effects on savings rates, have also been estimated. Sometimes the analyst is interested as much in trying to gain insight into the epidemic's differential effects on particular sectors of the economy as in estimating its effects on GDP as a whole.

Some studies have employed cross-national data, which may pertain to a single time period or to a time series. In those analyses, regression analysis was used to estimate the effects of one or more indicators of the volume of HIV/AIDS infections or deaths on economic outcomes, controlling for other variables that previous work had identified as having an important effect on economic growth.

Other analyses have employed an economic model fitted to the data of a particular country and, usually, projected for 10 or 15 years into the future. In a typical neoclassical growth model, AIDS affects total output directly, by decreasing the number and efficiency of workers, and also indirectly, by decreasing savings and investment. Since HIV/AIDS also results in a lower population than would otherwise have existed, the effect on GDP per capita is smaller than the effect on total output; at least in principal, there could be situations in which the net effect on GDP per capita would be nil or even positive. Since it is commonly the case that the values of some of the model's key parameters are not precisely known, analyses often include various scenarios, assuming different plausible values for the unknown parameters.

Some analyses have further elaborated the model by positing a dual-sector economy, in which there is a relatively well-paying and productive formal sector, which tends to employ the more highly skilled workers, and a relatively low-wage, low-productivity informal sector that employs labour that is in surplus to the needs of the formal sector. With such a dual-sector model, the predicted economic effects of the HIV/AIDS pandemic can vary significantly depending on the degree to which infections are assumed to be concentrated in the more skilled workers that are key to the functioning of the formal sector. If a country has a substantial pool of surplus labour with very low marginal productivity, and if HIV/AIDS is highly concentrated in the pool of unskilled labour, then even a substantial prevalence of HIV/AIDS might have only a small effect on performance of the macroeconomy, while if the same number of infections were to occur in the skilled labour force, the macroeconomic effect could be large.

The latter type of model has, however, been criticized by some analysts (for example, Cohen, 2002) for downplaying the importance of the informal sector as an engine of economic advancement and also for downplaying the degree of expertise embodied in informal-sector employees and entrepreneurs, whose knowledge may be as difficult to replace as that of the skilled workers of the formal sector. Even if a substantial loss of unskilled labour were to have only a minor impact the growth of GDP in a particular economy, the impact on the families that depended on such labour would be dire. Many families depend on low-wage workers to maintain a basic level of subsistence, and the loss of those workers will deepen their poverty (see chapter III).

Other, more elaborated models have also been used to analyse how the impacts of HIV/AIDS on different sectors of an economy relate to overall economic performance. For instance, Kambou, Devarajan and Over (1992) applied an eleven-sector computable general equilibrium (CGE) model to estimate the economic effects of HIV/AIDS in Cameroon. The model is based on a snapshot picture of an economy contained in a social accounting matrix. CGE models are rich in sectoral and distributional data as compared with time-series-based and aggregated macroeconometric models, and are widely used to evaluate

trade and expenditure, since they commonly have differential impacts within society. Again, a lack of knowledge about many of the variables and their relationships often makes it necessary to make assumptions or borrow estimates from other situations in order to apply the models to the situations of particular countries affected by HIV/AIDS.

Another approach is to focus only on those directly affected by the epidemic, excluding from consideration the rest of the society. For example, Broomberg (1993) estimated the cost of HIV/AIDS in South Africa. The costs are divided into direct costs and indirect costs, where direct costs include the costs of health services provided by both public and private sectors to the persons living with AIDS at all stages of the disease, including testing costs, prevention research and education. The indirect costs include the economic value of disability and premature mortality as a result of HIV/AIDS, estimated as the present value of lost future earnings. The approach leaves out such macroeconomic effects as reduced investment as resources are diverted from other economic areas in order to cope with HIV/AIDS. Good-quality estimates of the direct and indirect costs of dealing with the epidemic are, however, much needed in order to derive sound estimates of the full macroeconomic effects.

C. Evidence of the impact of HIV/AIDS

Many of the available studies on the impact of AIDS on the economy have covered the southern part of Africa, which currently has the highest levels of HIV prevalence. Some studies have also been conducted on countries in Eastern Africa, the region with the second-highest HIV prevalence, and some have covered other regions.

The macroeconomic effects of HIV/AIDS are explored below in terms of the differences in projected annual growth rates between "with-AIDS" and "no-AIDS" scenarios. It should be borne in mind that the effects of lower growth rates will cumulate over time since, unlike epidemics of such contagious diseases as influenza, HIV/AIDS will continue to exert its effects for many years into the future. For example, if the growth rate of GDP is lowered by HIV/AIDS by 1, 2 or 3 percentage points per year, in 15 years it will produce an economy that is smaller by about 15, 25 or 35 per cent respectively than it would have been in the absence of AIDS.

Dixon, McDonald and Roberts (2002) and Cornia and Zagonari (2002) reviewed studies that attempted to quantify the effect of HIV/AIDS on growth of GDP and GDP per capita in Africa. According to Dixon, McDonald and Roberts (2002, p. 233), "the consensus from these studies is that the net effect on the growth of GDP per capita will be negative and substantial. The more recent studies show greater effects; and the most recent estimates indicate that the pandemic has reduced average national growth rates by 2-4 [percentage points] a year across Africa". Impacts on GDP per capita are smaller, and range from substantially negative to negligible or even positive impacts over the medium term of 10 or 15 years. The results of selected studies are summarized below and in table 18:

- Among the earlier papers, studies by Cuddington (1993a and 1993b) and Cuddington and Hancock (1994), using a neoclassical one-sector, two-factor growth model to predict economic growth in Malawi and the United Republic of Tanzania, found that over the period 1985-2010, GDP growth would be reduced by up to 1.5 percentage points in Malawi and 1.1 percentage points in the United Republic of Tanzania. Assuming that AIDS treatment costs would be entirely financed from savings, the AIDS epidemic would reduce per capita GDP growth by 0.3 percentage points in Malawi and by 0.1 percentage points per year in the United Republic of Tanzania.

- Applying an eleven-sector computable general equilibrium model to the analysis of the impact of AIDS in Cameroon, Kambou, Devarajan and Over (1992) found that over a period of five years the loss of an urban worker had seven times the negative impact on production as would the loss of a rural worker. In the capital goods, construction and ser-

TABLE 18. SUMMARY OF STUDIES OF THE MACROECONOMIC IMPACT OF HIV/AIDS IN AFRICA

Study	*Countries and period of economic data*	*Period of most recently used HIV/AIDS data*	*Results (comparison with non-HIV/AIDS scenario)*	
			Growth of GDP	*Growth of GDP per capita*
Dixon, McDonald and Roberts (2001)	41 countries (1960-1998)	Late 1990s	GDP growth rates reduced by 2-4% per year; large variation across countries, in line with prevalence of HIV	
World Bank (2001b)	Swaziland	Early 1990s	Average annual growth rate of GDP during 1991-2015 will be 1.3% lower	Average annual growth rate of GDP per capita during 1991-2015 will be 0.2% higher
World Bank (2001a)	Namibia	Early 1990s	Average annual growth rate of GDP in 1991-2015 will be 0.8% lower	Average annual growth rate of GDP per capita during 1999-2015 will be 0.1% higher
World Bank (2000)	Lesotho	Early 1990s	Average annual growth rate of GDP during 1999-2015 will be 1.4% lower	Average annual growth rate of GDP per capita during 1999-2015 will be 0.3% lower
Bonnel (2000)	About 50 countries (1990-1997)	Mid 1990s		Rate of growth of GDP per capita in Africa reduced by 0.7% per year in the 1990s (1.2% for a country with HIV prevalence of 20%)
Quattek and Fourie (2000)	South Africa	Mid 1990s	Average rate of GDP growth over next 15 years will be 0.3-0.4% lower per year	
Arndt and Lewis (2000)	South Africa	–	Annual growth rate of GDP is lowered by about 0.5% in the late 1990s, rising to 2.5-2.6% during 2008-2010	GDP per capita will be 8% lower in 2010 than in the absence of AIDS; implies that AIDS lowers average annual growth rate of GDP per capita by 0.7% during 1997-2010
Greener, Jefferis and Sifambe (2001)	Botswana	Late 1990s	During 1996-2021, annual growth rate of GDP reduced by 1.1-2.1%, 1.5% in the scenario considered most likely	Little effect: annual per capita GDP growth rate between 0.6% lower and 0.4% higher due to AIDS; 0.1% lower in the scenario considered most likely
BIDPA (2000a)	Botswana	Late 1990s	Average rate of growth of GDP in 2000-2010 reduced by 1.5% per year	
Bloom and Mahal (1995)	51 countries (1980-1992)	Early 1990s	Statistically insignificant effect on income growth	
Cuddington and Hancock (1994)	Malawi	Early 1990s	Average rate of growth of GDP in 1985-2010 reduced by up to 1.5% per year	Average growth of per capita GDP reduced by up to 0.3% per year[a]
Cuddington (1993a, 1993b)	United Republic of Tanzania	Early 1990s	Average annual rate of growth of GDP in 1985-2010 reduced by up to 1.1%	Average annual growth reduced by up to 0.5%
Kambou, Devarajan and Over (1992)	Cameroon	–	GDP growth rate over 1986-1991 reduced by 1.9% per year	
Over (1992)	30 sub-Saharan countries	Early 1990s	Average annual growth rate of GDP during 1990-2025 reduced by 0.9% on average (up to 1.5% in 10 worst affected countries)	Average annual growth rate of GDP per capita reduced by 0.15% per year (up to 0.6% in 10 worst affected countries)

Sources: Based on S. Dixon, S. McDonald and J. Roberts, "AIDS and economic growth in Africa: a panel data analysis", *Journal of International Development*, vol. 13 (2002); G. Cornia and F. Zagonari, "The HIV/AIDS impact on the rural and urban economy", in *AIDS, Public Policy and Child Well-Being* (Florence, Italy, UNICEF Innocenti Research Centre, 2002); and the studies cited in the table.

NOTES: A hyphen (-) indicates "not applicable". References to effect on GDP growth rates refer to average annual growth rates for the period mentioned, expressed as percentage point differences from a "no-AIDS" scenario.

[a] For "extreme" assumption about future AIDS prevalence.

vices sectors, the negative impact would be 100 times larger when the lost workers were skilled and urban.

- Over (1992), using a model that distinguished between three classes of workers and between rural and urban production, projected the macroeconomic impact of AIDS on the growth trajectories of 30 countries in sub-Saharan Africa over the period 1990-2025. The macroeconomic impact varied depending on assumptions about relative levels of HIV infection in educated and uneducated workers and on the amount of the treatment costs taken from savings. For the assumptions the author regarded as most plausible (that 50 per cent of the treatment costs were financed out of savings and that each education class of workers has double the risk of the one beneath it), the net effect of the AIDS epidemic on the annual growth rate of per capita GDP was a reduction of about 0.15 percentage point on average and one third percentage point in the ten countries with the most advanced epidemics. The effect in the 10 most affected countries would be 0.6 percentage point if all the treatment costs were financed from savings.

- More recently, Theodore (2001) estimated the economic losses associated with HIV in three Caribbean countries (Jamaica, Saint Lucia and Trinidad and Tobago). He found that by 2005 HIV/AIDS would lead to a reduction of GDP, by comparison with a "no-AIDS" scenario, of 4.9 per cent in Jamaica, 2.1 per cent in Saint Lucia and 5.6 per cent in Trinidad and Tobago. Those estimates assume that all infected persons would be medically covered, with an estimated per capita treatment cost of $4,000.

- Bonnel (2000) used cross-national regressions to estimate relationships among economic growth, policy, institutional variables and HIV/AIDS. He estimated that, for a sub-Saharan country with HIV prevalence of 20 per cent, the annual growth rate of GDP per capita during the period 1990 to 1997 would have been 1.2 per cent higher without HIV/AIDS.

- Robalino, Jenkins and El-Maroufi (2002) developed a growth model to assess the risks of an HIV/AIDS epidemic and its potential economic consequences in nine countries in Western Asia and Northern Africa: Algeria, Djibouti, Egypt, Iran, Jordan, Lebanon, Morocco, Tunisia and Yemen. Adult HIV prevalence is still low in those countries, and prospects for future transmission are highly uncertain. However, given the mean values from the authors' simulations, HIV prevalence may reach 3-4 per cent of the adult population by 2015 (higher in Djibouti), and over the period 2000-2025, the annual growth rate of GDP would be 0.3-0.4 percentage points lower than in the absence of AIDS (1.6 points in Djibouti).

- A 2002 World Bank study of the economic impact of HIV/AIDS in the Russian Federation showed that GDP in 2010 could be up to 4 per cent lower and that without intervention the loss could rise to 10 per cent by 2020 (Ruhl, Pokrovsky and Vinogradov, 2002). The study projected that the most significant impact for long-term development was the uninhibited spread of HIV, which would diminish the economy's long-term growth rate, taking off half a percentage point annually by 2010 and a full percentage point annually by 2020. Another result of the study was that investment would decline more than production. In the pessimistic scenario, its level would decline by 5.5 per cent in 2010 and 14.5 per cent in 2020.

How large are these effects in comparison to other factors affecting economic growth? Some analysts note that other factors can produce effects

on economic growth that are at least as large as those estimated to result from the spread of HIV/AIDS. For instance, Greener (2002) states that a reduction in the rate of growth of GDP by between 0.5 and 2.6 percentage points, which encompasses the size of the effect indicated by most studies, "is within the range of variation that could be caused by poor economic management or fiscal policy. This implies that the macroeconomic impacts of HIV/AIDS, in themselves, can be substantially reduced by appropriate policy interventions" (Greener, 2002, p. 49). Nevertheless, such observations cannot bring much comfort, since such factors as poor economic management, war or drought are likely to make it all the more difficult to mount an effective response to the threat of HIV/AIDS.

In interpreting the estimates, it should be borne in mind that economic forecasting is not an exact science. It is not unusual to find economists—even those engaged in such analyses—adding cautionary notes about the reliability of the analytic outcomes. For instance, Cohen (1992) states, "It cannot be said that econometric modelling...has a good track record. Also, it should be readily admitted that we know relatively little about those structural relationships which are important for estimating the impact of HIV on development".

One manifestation of this uncertainty is that analysts may come to substantially different conclusions about the impact of HIV/AIDS on a particular economy as a result of differing assumptions built into their economic models. For instance, Haacker (2002b) observes that studies of South Africa by Quattek and Fourie (2000) and Arndt and Lewis (2000) drew on the same demographic projections; however, the first study predicted that GDP per capita would be 7.5 percentage points higher by 2010 than in the absence of AIDS, but the second study projected that GDP per capita would be 8 percentage points lower by 2010 than in the absence of AIDS.

Haacker (2000a and 2000b) argues that many analyses have ignored the potential negative impact of HIV/AIDS on foreign investment and that this has probably led to an underestimate of the negative effect of the epidemic on the macroeconomy. Specifically, many of the analyses employing one-sector and dual-economy neoclassical growth models imply that the rate of return to capital would decline, but the analyses usually do not take account of the declines in foreign investment and the outflow of domestic capital that may occur in response. Haacker's own estimates indicate that the effect could be large.

Some of the macroeconomic estimates presented above are themselves part of more comprehensive assessments that examine sector-specific impacts of HIV/AIDS and consider the effects on different strata of society. Such reports sometimes give a graver assessment of impacts on particular areas of the economy than might be supposed from the relatively modest size of the projected macroeconomic effects. Examples include the following:

- The World Bank study of Swaziland cited in table 18 estimated that HIV/AIDS would have the greatest impact on the agricultural, manufacturing and distribution sectors, which together accounted for over 60 per cent of value added in the national economy, with a likely devastating impact of AIDS on the productive sectors of the economy (World Bank, 2001b, p. 17). At the same time, the macroeconomic model employed projected essentially no effect on growth of GDP per capita over the period 1991-2015.

- In Botswana, related analyses by the Botswana Institute for Development Policy Analysis (2000a) and Greener, Jefferis and Siphambe (2001) conclude that even though per capita GDP will be little affected by the epidemic over the period 1996-2021, HIV/AIDS will come to dominate health systems, and AIDS patients may crowd out those with other illnesses. There will be an increase in poverty, and the degree of poverty will deepen. Up to half of households are likely to have at least one infected member, and one quarter of households are likely to lose an income earner within 10 years. In this

> case, the divergence between the serious effects projected for households and the health sector and the relatively modest projected macroeconomic results can be attributed to the circumstance that Botswana's macroeconomic performance and its Government income are heavily dependent on its diamond industry, which is capital intensive and whose revenue probably will not be greatly affected by AIDS. Most of the impact is likely to fall on households, whose per capita income may fall by 8-12 per cent over the period 1996-2021 (Greener, Jefferis and Siphambe, 2001).

A number of researchers have argued that analyses of the epidemic's macroeconomic effects tend to give an overly sanguine assessment of the eventual economic impact of the epidemic because they fail to take account of effects on human capital and social capital that will become increasingly prominent as time goes on. According to Bell, Devarajan and Gersbach (2003, p. 2), "not only does AIDS destroy existing human capital, but by killing mostly young adults, it also weakens the mechanism through which knowledge and abilities are transmitted from one generation to the next; for the children of AIDS victims will be left without one or both parents to love, raise and educate them". A report by McPherson (2003, p. 4) states: "None of the models has adequately allowed for the erosion of networks and information channels that are fundamental to labour specialization and the maintenance of social capital".

That the available estimates are open to question does not detract from the importance of trying to assess overall economic effects of the epidemic (Greener, 2002). Policy makers need to have some understanding of how the epidemic will affect the economy and government income if they are to make sound choices in combating the epidemic and its effects.

D. Beyond gross domestic product: income distribution and welfare

Gross domestic product is not itself a measure of welfare. For one thing, the costs of responding to manmade or natural disasters add to GDP, even though well-being would have been greater had that spending not been needed. According to Greener (2002, p. 50), "activities such as increased household and government expenditure on health care related to HIV...will be counted as a part of GDP, even though they are not part of what would normally be thought of as a productive activity. Impact should perhaps be measured in terms of a more satisfactory indicator of socially productive economic activity". Another limitation is that conventional macroeconomic indicators are not by themselves informative about trends in the distribution of income nor, in particular, about the extent of and trends in poverty. In addition, as mentioned previously, the concept of "development" is too broad to be captured by measures of material welfare alone.

Most economists who have commented on the issue think that HIV/AIDS in developing countries will tend to make income distribution more unequal and will increase poverty, notably by impoverishing many of the households directly affected by the disease (see chapter III). Such effects can be dire for the well-being of the population and yet might have relatively little impact on GDP as conventionally measured: the fraction of national income represented by the poor is much smaller than the fraction they represent in the total population, and it follows that the deepening impoverishment of those who were already poor may have little effect on macroeconomic statistics.

With respect to indicators of welfare broader than GDP, a few studies used the human development index developed in the early 1990s by the United Nations Development Programme as an indicator to assess the impact of HIV/AIDS (Cohen, 1998; Gaigbe-Togbe, 2001). AIDS af-

fects the index through its effects on life expectancy, which is a component of the index.

Another approach is to try to include the economic value of health as an aspect of "economic welfare", which by definition is not a matter of income alone. Jamison, Sachs and Wang (2001) attempted to assess the contribution of mortality changes in sub-Saharan Africa to such a broader measure of economic welfare. The first step is to estimate in monetary terms the value that societies place on improved longevity and then to use such valuations to derive a more inclusive measure of trends in economic welfare that incorporates trends in both mortality and GDP per capita. Empirical assessments of societies' willingness to pay to avert an adult death have found values ranging from about 75 to over 180 times per capita GDP (Jamison, Sachs and Wang, 2001). Therefore, the value attached to actual mortality changes can be large in relation to the size of conventionally measured trends in GDP. Estimates for five countries that have been heavily impacted by HIV/AIDS (Botswana, Kenya, Malawi, Zambia and Zimbabwe) show that between 1960 and 1985, when mortality was falling, the impact of lower mortality was to add a welfare value that was between 1.7 and 2.7 percentage points per annum above the growth rate of per capita GDP alone. However, between 1985 and 2000 the impact of the AIDS-induced increase in mortality was to subtract between 5 and 8 per cent annually, producing substantial reductions in the combined GDP/mortality measure of change in economic welfare. Crafts and Haacker (2003) adopted a similar approach to estimate the economic value of the loss in life expectancy attributable to HIV/AIDS, expressed as a percentage of GDP. They estimated that the value of welfare losses in 2003 resulting from lower life expectancy was substantial even in countries where HIV prevalence was 1-3 per cent and "horrific" in the countries with the highest prevalence. For instance, in the countries with adult HIV prevalence above 10 per cent, the estimated welfare loss caused by higher mortality has already resulted in a loss of welfare of over 40 per cent of GDP, and in Botswana this figure is about 80 per cent. The direct welfare effects of HIV/AIDS through increased mortality substantially outweigh even the worst projections of the impact on GDP per capita (Crafts and Haacker, 2003, p. 17).

E. CONCLUSIONS

At present there is little agreement among economists about the extent of the effects on national economies that are directly attributable to the HIV/AIDS epidemic. The most enduring impact of AIDS on a country's economic development may be the loss of human capital, which represents a long-term investment and is rarely captured in economic models. The major findings of chapter VIII are summarized below:

- **Estimated effects of the epidemic on the rate of growth of GDP in affected countries range from "small" to annual GDP growth rates of 2-4 percentage points lower than in the absence of AIDS**. Estimates of the macroeconomic effects of HIV/AIDS are subject to a wide range of uncertainty. Differences in models and in assumptions sometimes lead to substantially different economic projections for the same country.

- **More recent analyses have tended to produce larger predicted impacts**. The projections may mainly show that HIV prevalence is rising over time and that earlier projections of HIV prevalence have in many cases proven to be too low.

- **The longer-term effects on the economy may be more serious than most macroeconomic estimates suggest**. Estimates of AIDS' effects on macroeconomic performance usually take no account of the loss of "social capital" or of the long-term damage that is accruing to human capital, as children's education, nutrition and health suffer directly and indirectly as a consequence of HIV/AIDS. The effects of lowered investment in the human capital of the younger generation will affect economic performance over future decades,

well beyond the time frame of most economic analyses.

- **Beyond its effects on growth of GDP, the HIV/AIDS epidemic is likely to exacerbate income inequality and increase poverty**.

- **The effects of HIV/AIDS on a population's welfare are not reducible to effects on GDP per capita**. Based on empirical evidence of societies' economic valuation of a death, the epidemic's effect on mortality itself represents a loss of welfare that dwarfs the estimated effects of HIV/AIDS on GDP.

Despite the uncertainties that surround such estimates, there remains a need for policymakers to understand the impacts that HIV/AIDS will have on overall performance of economies and budgets. In the most affected countries, the HIV/AIDS epidemic is yet another obstacle on the road to development. The difficulty of measuring the impact of the AIDS epidemic does not mean that there is less cause for alarm. Indeed, the real likelihood is that the full impact has yet to occur.

IX. CONCLUSIONS

HIV/AIDS is the deadliest epidemic of our time. Over 22 million people have already lost their lives, and more than 42 million are currently living with HIV/AIDS. Even if a vaccine for HIV were discovered today, over 40 million people would still die prematurely as a result of AIDS. In many countries, especially in Africa and the hardest-hit countries such as Botswana, Swaziland and Zimbabwe, the AIDS epidemic has spread rapidly, leaving illness, death, poverty and misery in its wake. In other countries, the disease is still in its early stages. Notably, HIV/AIDS has now taken hold in the largest countries of the world: the number of people infected with HIV has reached one million in China and six million in India, and the destructive effects of the epidemic are already being felt in those countries.

The epidemic affects every aspect of human life, with devastating consequences. It has imposed heavy burdens on individuals, families, communities and nations. In many countries, the epidemic is undermining personal aspirations, family well-being and national development. The epidemic is threatening the achievement of the Millennium Development Goals.

The impact of AIDS is already strikingly apparent in the countries with the highest prevalence rates. In those countries, the impact on mortality and on population size and growth is already substantial. In the most severe case, Botswana, where currently more than one in three adults is HIV positive, life expectancy is expected to drop from 65 years in 1990-1995 to just under 40 years in 2000-2005. As a result of the high death rate, Botswana's population is expected to decline within the next few years.

HIV/AIDS is not just a demographic disaster; the epidemic has consequences for every sector of society. The present report reveals the wide-ranging societal impacts of HIV/AIDS: on individuals, families and households; on agricultural sustainability; on business; on the health sector; on education; and on national economic growth.

The burdens of the disease on families and households are staggering. Typically, a family where the disease is present loses an adult in the prime of life, leaving behind not only a bereft family, but also an HIV-infected spouse and orphaned children. During the long period of illness, the loss of income and the cost of caring for family members may bring ruin to the household. The stigma of the disease will be endured not only by those who are ill but also by family members, and, even after death, the stigma will be felt by the survivors. Adult deaths, especially of parents, often cause households to be dissolved and children sent to live with relatives or even abandoned to the streets.

In the agricultural sector, the loss of farm workers to HIV/AIDS has ramifications for food security. A survey in Zimbabwe found that agricultural output declined by nearly 50 per cent among households affected by AIDS. The Food and Agriculture Organization of the United Nations has estimated that the ten most severely affected African countries will lose between 10 and 26 per cent of their agricultural labour force by 2020.

Business enterprises in both the agricultural and non-agricultural sectors are also affected by the disease, as the most productive workers in the labour force become too ill to work and eventually die. Ill workers are less productive, as are those workers who must care for ill family members. The costs of health and death benefits and replacing experienced workers have serious financial implications for businesses and may cause them to become less competitive and eventually close down.

In countries with high HIV prevalence, output in the agricultural, industrial and service sectors is expected to suffer as more workers are afflicted and the labour force weakens and shrinks. Funds for investment and savings are often diverted to pay for health care and social welfare benefits for afflicted families. As a result, economic development will likely stall or lose ground.

AIDS reduces the means and the incentives to invest in human capital. The next generation will be less healthy and less well educated than the previous one. In particular, HIV/AIDS seriously threatens the education of the next generation. In households affected by HIV/AIDS, children are often taken out of school to help at home with caregiving or income-generating activities. AIDS orphans suffer long-term disadvantages when their education is interrupted. Experienced teachers are also dying of AIDS, eroding the quality of education.

Health-care systems were already inadequate in many of the countries even before HIV/AIDS struck. The additional demand for treatment of AIDS and the opportunistic infections that are common in people with compromised immune systems have strained resources, burdened programmes and threatened the viability of the entire health-care system in a growing number of countries.

Development involves more than the pursuit of economic growth. A long and healthy life is one of the most highly coveted components of human existence. Health and longevity are not merely intermediate goals on the path to socio-economic development, but rather are among the fundamental pillars of development. At the Millennium Summit in September 2000, world leaders adopted the United Nations Millennium Declaration, which contained a set of time-bound and measurable goals and targets.

One of the eight Millennium Development Goals refers directly to the need to fight against HIV/AIDS:

- **By 2015, halt, and begin to reverse the spread of HIV/AIDS, malaria and other major diseases**

HIV/AIDS is also seriously threatening the achievement of the other seven Millennium Development Goals, namely:

- **Eradicate extreme poverty and hunger**

AIDS is contributing to the impoverishment and malnutrition of households and communities that are affected by the epidemic.

- **Achieve universal primary education**

With the increasing number of children leaving school to care for ill relatives or to replace them on the farms and in the workplace, the AIDS epidemic has made the goal of universal primary education much more difficult to achieve, especially in the hardest-hit countries.

- **Promote gender equality and empower women**

HIV/AIDS affects both men and women, but at different ages and stages of the lifecycle. Women are particularly vulnerable to HIV/AIDS, and the burden of caring for AIDS victims in households falls heavily on girls and women.

- **Reduce child mortality**

One of the direct impacts of the HIV/AIDS epidemic is the increase in the mortality of children under five. Children die young from HIV owing to mother-to-child transmission and to the weakened ability of infected mothers to care for their infants and young children.

- **Improve maternal health**

HIV/AIDS impairs the maternal health of infected women. In countries of sub-Saharan Africa where women are more affected by HIV/AIDS than men, the impact on maternal mortality is more severe than in other regions.

- **Ensure environmental sustainability**

HIV/AIDS is reducing the ability of nations and communities to integrate principles of sustainable development into their policies and programmes, in particular the provision of safe drinking water and adequate housing.

- **Develop a global partnership for development**

The HIV/AIDS epidemic is undermining national economies and development efforts and places heavy burdens on nations to deal with the consequences of the epidemic.

. . . . . .

By its resolution 26-S/2 (annex), the General Assembly, at its twenty-sixth special session in June, 2001, adopted the Declaration of Commitment on HIV/AIDS. The Declaration states that "the global HIV/AIDS epidemic, through its devastating scale and impact, constitutes a global emergency and one of the most formidable challenges to human life and dignity, as well as to the effective enjoyment of human rights, which undermines social and economic development throughout the world and affects all levels of society—national, community, family and individual".

Since the adoption of the Declaration of Commitment, the HIV/AIDS epidemic has worsened and become more widespread. The report of the Secretary-General to the fifty-eighth session of the General Assembly on progress towards implementation of the Declaration of Commitment on HIV/AIDS (United Nations, 2003e) emphasizes that assertive political leadership and effective action are required to prevent a major expansion of HIV/AIDS. The report recommends that all countries develop and implement national strategies to promote the delivery of comprehensive prevention, treatment, care and support to those people living with or affected by HIV/AIDS.

In order to conquer HIV/AIDS, considerably greater efforts and resources will be required. As the Secretary-General concludes in his report, "to finance the global response, …annual funding for HIV/AIDS programmes must increase threefold over current levels by 2005, and fivefold by 2007" (United Nations, 2003e).

The course of the HIV/AIDS epidemic is by no means predetermined. The eventual course of the disease depends on how individuals, communities, nations and the world respond to the HIV/AIDS threat, today and tomorrow.

PART TWO

X. SUMMARIES OF SELECTED STUDIES ON THE IMPACT OF HIV/AIDS

Part II of *The Impact of AIDS* provides summaries of selected studies referred to in earlier chapters. For each study, the summary gives a brief overview of the objectives and results of the research. Much of the usefulness of the results depends on how a study was carried out. The summaries give information about the methodology, the size of the sample and whether it was representative, whether a control group was used and how the analysis was performed. The country or countries examined are shown, as are outcomes of interest and key results. Some literature reviews are also included.

The studies presented here are by no means an exhaustive review of work on the impact of HIV/AIDS. The volume of research under way means that results of studies are being published with great frequency. Some of the studies cited, such as conference papers and preliminary reports on ongoing research, have not yet been published, and others exist only in electronic form or in the grey literature. The summaries are arranged according to the order of chapters in the report, beginning with households and ending with impacts on economic growth.

A. STUDIES ON HOUSEHOLDS

Ainsworth, Martha, and Deon Filmer (2002). Poverty, AIDS and children's schooling: a targeting dilemma

Summary: The study analysed the relationship between orphan status, household wealth and child school enrolment using data collected in the 1990s from 28 countries in sub-Saharan Africa, Latin America, the Caribbean and Southeast Asia. Examples were found of large differentials in enrolment by orphan status, but in most cases the gap between children from richer and poorer households was more dominant. The gender enrolment gap was not substantially different from the gap between girls and boys whose parents were living. The enormous diversity across countries underscores the need to assess the specific country situation before considering mitigation measures.

Countries: **Western Africa**: Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Côte d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, Senegal and Togo; **Eastern Africa**: Kenya, Madagascar, Tanzania and Uganda; **Southern Africa**: Malawi, Mozambique, South Africa, Zambia and Zimbabwe; **Latin America**: Brazil, Guatemala and Nicaragua; **Caribbean**: Dominican Republic and Haiti; **Southeast Asia**: Cambodia.

Study area: Nationally representative samples from 34 Demographic and Health Surveys and five Living Standards Surveys.

Methodological approach: For asset ownership and housing characteristics: principal components analysis; for wealth status, orphanhood and enrolment status: regressions.

Sample size: Total sample sizes for children 7-14 ranged from 5,000 to 24,500, but most were about 5,000 to 10,000.

Control group: Orphans compared with other children in the general population.

Outcomes studied: Prevalence of orphans in 28 countries; wealth status of households with orphans; relationship between orphanhood and school enrolment; school gender gap.

Key results: In all countries, there were more paternal than maternal orphans, and some countries had two or three times as many paternal orphans. Only a small percentage of children aged 7-14 were two-parent orphans, ranging from 0.2 per cent in the Dominican Republic to 4.5 per cent in Uganda. In all countries, most single-parent orphans lived with the surviving parent, but in Eastern and Southern Africa, maternal orphans were less likely to live with their fathers than in other countries. Orphans aged 7-14 were less likely

to be enrolled in school than non-orphans in 22 of 28 countries, regardless of the overall enrolment level in the country. In Chad, Mali, Niger and Southern Africa, enrolment rates were similar for orphans and non-orphans, but in Nigeria and the United Republic of Tanzania, enrolment rates for orphans were higher than those for children with parents. Twenty-five of 28 countries had large differences in enrolment rates according to the wealth status of the household, but this did not always translate into a disadvantage for orphans. The relationship between orphan status, wealth status and the enrolment gender gap showed no clear pattern across countries of discrimination against female orphans.

Baier, E.G. (1997). The impact of HIV/AIDS on rural households/communities and the need for multisectoral prevention and mitigation strategies to combat the epidemic in rural areas

Summary: The study investigates the impact of HIV/AIDS on rural households in Eastern Africa. It shows the detrimental impact that HIV/AIDS may have on rural households' productive capacity. The paper suggests that the effects of HIV/AIDS are felt on two key farm production parameters. First, household labour quality and quantity are reduced, initially in terms of productivity when the HIV-infected person is ill and later when the supply of household labour falls with the death of that person. Moreover, the probability that more than one adult per family is infected is high, given the heterosexual nature of HIV transmission in Africa. A compounding factor is that infection rates are higher among women, who account for 70 per cent of the agricultural labour force and 80 per cent of food production. In addition, other household members will devote productive time to caring for the sick persons and observing traditional mourning customs, which can last as long as 40 days for some family members and can adversely affect labour availability.

The second factor in household agricultural production that HIV/AIDS will affect is the availability of disposable cash income. During episodes of illness, household financial resources may be diverted to pay for medical treatment and eventually to meet funeral costs. Such resources might otherwise be used to purchase agricultural inputs, such as occasional extra labour or other complementary inputs (e.g., new seeds or plants, fertilizer, pesticides). Family assets such as livestock might be sold off. If a household becomes unable either to supply such labour internally or to hire temporary workers, the composition of crops may be gradually altered, shifting from cash to subsistence crops in some cases. The key constraint will be during periods of peak labour demand, usually in planting and harvesting seasons. Given the nature of the rural labour market, those seasons are also the times when wages or opportunity costs are highest. Another response to labour shortages may be to reduce the area under cultivation. Furthermore, it is likely that livestock production may also be less intensive and that the farming quality will be affected, with weeding and pruning activities curtailed. The shift from high labour-intensive crops to low labour-intensive crops will curtail vegetable cultivation, resulting in a less varied and less nutritious diet. Labour-intensive farming systems with a low level of mechanization and agricultural input are particularly vulnerable to the impact of the disease.

Countries: Uganda, United Republic of Tanzania and Zambia.

Study area: Rural areas of the selected countries.

Methodological approach: Not stated, rapid rural appraisal.

Control or comparison group: Not applicable.

Sample size: Not stated.

Outcomes studied: Agricultural production, farm income, livestock production, medical expenses and funeral costs.

Key results: Decline in farm income, decline in cropping intensity and livestock, increase of medical expenses and funeral costs.

Basu, Alaka M., Devendra B. Gupta and Geetanjali Krishna (1997). The household impact of adult morbidity and mortality: some implications of the potential epidemic of AIDS in India

Summary: The study examined how socio-economic status affected the risk of contracting HIV and the nature and extent of the impact of fatal illness on household welfare. Most households with an illness or death could expect little help from government benefits or employer-subsidized insurance and had to bear the burden of medical expenses themselves. The larger extended family or kin group provided the main cushion for absorbing a crisis such as an AIDS-related illness or death. The most common response to loss of income from a family member's illness or death was to seek loans; savings and assets were too small to play a major role in coping strategy. Self-employed households were better able to substitute other household members for the incapacitated individual than were wage-earning households.

Country: India.

Study area: Delhi.

Methodological approach: This exploratory study used a structured survey complemented by qualitative data collection, including in-depth anthropological studies. Since prevalence rates are still low in India, the researchers focused on the hypothetical case as a way to understand the economic impact of a major illness on households. This method was supplemented by case studies of households that had actually experienced an adult death.

Sample: A representative sample of men aged 19 to 39 from all parts of Delhi, ranging from slums to upper-income neighbourhoods. The sample frame came from a larger recent survey of the city.

Sample size: Interviews with 484 men; case studies of 33 households that had experienced an adult death in the last two years.

Control or comparison group: No.

Outcomes studied: Relationship between socio-economic status and probability of contracting HIV/AIDS; impact of the illness or death of an adult family member and coping strategies practised by families.

Key results: The study was theoretical, so direct estimates of impacts were not made. However, relationships between contracting the disease and dealing with it are elucidated, and suggestions that would lessen the impact of HIV/AIDS by taking advantage of the unique cultural and household supports available in Indian families are offered for policy makers. The study found that general awareness of HIV/AIDS was high but that erroneous notions about the illness persisted, in spite of an extensive information campaign. During the initial stages of the AIDS epidemic, the better-off groups seemed to be more susceptible to acquiring the infection than poorer groups because they could afford the kind of high-risk lifestyle that increased their susceptibility. However, the profile of AIDS sufferers was found to be changing rapidly, with increasing numbers of infections occurring in the individuals least able to prevent or deal with the spread of the disease.

The impact of the death of an adult household member varied along standard socio-economic lines, with poor households bearing proportionately more of the costs of the illness and death of a family member. However, the study also looked at other social and cultural attributes that affect a household's ability to cope. For example, in many families women do not join the labour force after the death of a spouse because the society considers it inappropriate for a woman to work outside the home. At the same time, family structure may mitigate the impact of a crisis; joint families had greater access to help and other resources than did nuclear families. Case study interviews confirmed that the larger family unit provided substantial help to family members of an ill adult male.

Béchu, N. (1997) The impact of AIDS on the economy of families in Côte d'Ivoire: changes in consumption among AIDS-affected households

Summary: The study investigated the impact of AIDS on household consumption in Côte d'Ivoire.

Health-care expenditures were greater in households with an AIDS victim during the first year after diagnosis of the disease but fell as the disease progressed. The findings conflicted with the hypothesis that the consumption of health care rises as the disease becomes more serious and appeared to indicate that persons with AIDS became less interested in care—both modern and traditional—that could not cure them. Consumption in households with an AIDS death declined and did not return to former levels after the AIDS death.

Country: Côte d'Ivoire.

Study area: Urban and semi-rural areas.

Methodological approach: Households selected were monitored for consumption patterns in multiple rounds of a survey. Categories of consumption included basic needs, other current expenditures, exceptional expenditures and the patient's health expenditures.

Sample: The study was part of a larger survey of 600 households in Burundi, Côte d'Ivoire and Haiti. Households were selected after being identified by a health facility as containing an adult with AIDS. At least one adult in the selected households had to be ill with AIDS and had to be responsible for one or more children.

Sample size: Of 200 households in the Côte d'Ivoire sample, 120 were followed over a period of 20 months. The data for the study were from 107 of the 120 households (87 from urban areas and 20 from semi-rural areas); interviews were conducted six times at two-month intervals.

Control group: Consumption data were compared with the results of a study conducted in Yopougon, the second largest district in Abidjan, and were based on a sample of 2,064 households.

Outcomes studied: Changes in consumption of households with an AIDS-infected member as the illness progressed and the ill person died.

Key results: Households with an AIDS patient spent almost twice as much of their household budgets (10.6 per cent) on health care as did households in the comparison group, and health care costs for the person with AIDS accounted for almost 80 per cent of the household health budget. Consumption per household member declined during the first year after AIDS was diagnosed. However, health care consumption by the person with AIDS fell by almost one half between the first and fourth rounds of the survey, suggesting that persons with AIDS no longer sought care that could not cure them. In households with an AIDS death, consumption of food declined, but a general upturn in consumption was observed after a few months. Households with an AIDS death did not return to their earlier level of consumption.

Bicego, George, Shea Rutstein and Kiersten Johnson (2003). Dimensions of the emerging orphan crisis in sub-Saharan Africa

Summary: The study used recent data from the Demographic and Health Surveys to examine (a) the levels, trends and differentials of orphanhood in 17 countries in sub-Saharan Africa and (b) trends and age-patterns in orphan prevalence and welfare in the 1990s for five countries with a wide range of HIV prevalence levels (1.4 to 25.1 per cent). Findings showed a strong correlation between orphanhood prevalence and national adult HIV prevalence estimates, although the relationship was affected by the timing of the onset of the disease. Orphans were more likely to live in households headed by females or grandparents than were non-orphans. In general, orphans did not live in poorer households than non-orphans, although this varied across countries. Losing one or both parents was significantly associated with lower educational attainment.

Countries: For the prevalence study: Benin, Cameroon, Chad, Ghana, Guinea, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe. For the in-depth study: Ghana, Kenya, Niger, United Republic of Tanzania and Zimbabwe.

Study area: Nationally and regionally representative samples.

Methodological approach: Univariate and multivariate analysis, logistic regressions.

Sample size: Average sample size was from 5,000 to 8,000 households per country.

Control group: Orphans compared with other children in the general population.

Outcomes studied: Level and trend of orphanhood compared with national HIV/AIDS prevalence rate; likelihood of living in female-headed or grandparent-headed household; economic situation of households with orphans; schooling opportunities for orphans.

Key results: Maternal orphan prevalence ranged from less than 2.5 per cent in Mali and Niger to more than 4.5 per cent in Malawi, Mozambique, Uganda and Zimbabwe. Paternal orphanhood was higher in every country and ranged from about 4 per cent to more than 8 per cent. The percentage of orphans who had lost both parents was higher in severely impacted countries in East and Southern Africa (10-17 per cent of all orphans) than in West and Central Africa (4-8 per cent). Earlier onset of the disease was associated with higher orphan prevalence. Orphans were much more likely than non-orphans to live in households headed by grandparents—one fourth to one half of orphans compared with 10-20 per cent of non-orphans. In Zimbabwe, 50-55 per cent of orphans lived in households headed by grandparents. Orphans were also more likely than non-orphans to live in female-headed households, but the differential varied across countries. Orphans were less likely than non-orphans to be at the proper educational level for age. East African double orphans 6-10 years old were only half as likely as non-orphans to be in the appropriate grade, and double orphans 11 to 14 were two thirds as likely to be in the proper grade.

Bloom, David E., Ajay Mahal, Lene Christiansen, Amala de Silva, Soma de Sylva, Malsiri Dias, Saroj Jayasinghe, Swarna Jayaweera, Soma Mahawewa, Thana Sanmugam and Gunatillake Tantrigama (1997). Socio-economic dimensions of the HIV/AIDS epidemic in Sri Lanka

Summary: This multidisciplinary study used both theoretical statistical evidence (projections based on a variety of assumptions) and survey research to estimate the vulnerability of Sri Lanka to HIV/AIDS. It used data from economics, statistics, anthropology, sociology and medicine as well as information about the spread of the epidemic in other countries to analyse the social and economic roots of HIV/AIDS in Sri Lanka. The objective of the study was to understand the epidemic before its full force reached Sri Lanka and to inform policy-making for the development of prevention and care strategies rooted in local realities. Using current assumptions about the future progress of the disease, the authors estimated that the AIDS epidemic would have an insignificant impact on the macroeconomy of Sri Lanka in the foreseeable future. Moreover, the epidemic was expected to have a negligible effect on Sri Lanka's level on the human development index. With regard to the impact on poverty and income distribution, evidence from surveys conducted by the authors suggested that better educated and higher-income people were more aware of the risks of AIDS and less likely to engage in risky behaviour, so an epidemic could increase inequality in the population.

Although at the time of the study HIV prevalence rates were low in Sri Lanka, the evidence suggested that the country was not immune to the epidemic, given its proximity to India and its high rate of international mobility associated with overseas contract work, tourism, military activity and refugees. Other factors that contributed to the country's vulnerability were unsafe medical practices, the commercial sex industry and a large proportion of the population in the sexually active years.

Country: Sri Lanka.

Methodological approach: Literature review of epidemiology of HIV/AIDS in various parts of the world. Cost-benefit analysis of screening the supply of blood, using disposable injection equipment and adopting universal precautions in health-care settings (that is, treating all patients as potential sources of infection). Economic analysis of medical costs of a future AIDS epidemic in Sri Lanka using hospital and clinic records to estimate future medical costs. Small surveys to examine links between income, educational status, knowledge of HIV/AIDS and risky behaviour. Economic analysis of the distribution of direct and indirect costs

of the AIDS epidemic to examine which segments of society absorb most of the costs of AIDS. Regression analysis of effect of AIDS epidemic on tourism.

Sample size: For study of education, income, knowledge of HIV/AIDS and risky behaviour, about 450 individuals were surveyed. For study of risky behaviour among workers in free trade zones, 50 female workers were interviewed. For study of overseas workers, 50 Sri Lankan women who had worked abroad were interviewed. For study of knowledge and risks of sex workers, 100 commercial sex workers were interviewed. For study of high-risk sexual behaviour among prisoners, 50 prisoners were interviewed. For study of the burden of AIDS costs, 34 families of AIDS victims were surveyed.

Control or comparison group: Not applicable.

Outcomes studied: The socio-economic dimensions of the HIV/AIDS epidemic in Sri Lanka, including the link between HIV and poverty; the benefits of blood testing; the cost-effectiveness of using disposable needles and syringes; the cost of adopting universal precautions in the medical care system; the economic burdens of the AIDS epidemic; individuals' perceptions of the risk of contracting AIDS and their willingness to pay to reduce the risk; the effect of an AIDS epidemic on the tourist industry.

Key results: An AIDS epidemic in Sri Lanka is expected to have only a small impact on the nation's economic growth and human development index. Less educated and lower-income individuals were found to be more likely to engage in risky behaviour and more likely to acquire HIV/AIDS. The medical costs of an epidemic would most likely be borne by taxpayers, since most health care in Sri Lanka is provided by public-sector health facilities. However, only the families of victims would bear the psychological costs of ostracism and stigmatization. Regression analysis of the relationship between AIDS prevalence and tourism found no statistical significance. A small survey of workers in free trade zones found little evidence to support the view that those workers were a group with a high risk of becoming infected with HIV. Testing blood for HIV infection was thought to be cost-beneficial under the high-prevalence scenario; using disposable syringes and needles was expected to be economically justified; and instituting universal precautions in health care settings in Sri Lanka was found not to be cost-beneficial at the time the study was conducted.

Booysen, Frikkie (2003). Poverty dynamics and HIV/AIDS-related morbidity and mortality in South Africa

Summary: The socio-economic impact of HIV/AIDS on households was examined using a cohort study of households affected by the disease and comparing them with a control group of households not currently affected. Affected households were more likely to experience poverty, but some poverty may have been transitory. Preliminary analysis suggested that HIV/AIDS-related determinants of poverty, in particular morbidity, explain why certain households are poorer than others and are likely to remain poor. Economic policies focusing on job creation and a social safety net targeting AIDS-related poverty should be considered for the short to medium term. The study is ongoing: three rounds of interviews have been conducted and analysed.

Country: South Africa.

Study area: One urban (Welkom) and one rural (QwaQwa) community in the Free State province in which HIV/AIDS is particularly prevalent.

Methodological approach: Longitudinal study, household interviews; descriptive analyses, simple mobility profiling and regression analysis.

Sample size: 355 households.

Control group: Yes.

Outcomes studied: Poverty level of AIDS-affected households compared with that of households not affected; income mobility of households affected by HIV/AIDS; incidence and severity of poverty; morbidity and mortality as determinants of chronic poverty.

Key results: Households affected by HIV/AIDS were more likely than unaffected households to be poor, regardless of the measures employed in measuring poverty. Households that experienced illness or death, especially in the recent past, had the most severe poverty and were more than twice as likely to be chronically poor than non-affected households. Affected households at the lower end of the income distribution were less mobile than other households. Households that experienced more deaths were less likely to improve their position in the income distribution and more likely to remain in poverty.

Busingye, J., J. Pickering, A. Ruberantwari and J. Whitworth (2003). Orphans in the HIV/AIDS era: a study in rural Uganda

Summary: The project studied the dynamics of the HIV-1 virus and its impact on a rural African population. The overall prevalence of orphans was found to be increasing over the course of the study, and the loss of a father was more common than the loss of a mother at all time periods. HIV-1 seropositivity rates were significantly higher among orphans than among non-orphans, and they were also higher among surviving parents of orphans as compared with parents of non-orphans. The study concluded that the orphan burden had been rising in the population and was associated with the HIV epidemic.

Country: Uganda.

Study area: A cluster of villages in southwestern Uganda.

Methodological approach: A general population cohort was established in 1989-1990, and the cohort was followed annually using face-to-face questionnaires and serological surveys. Questions on orphanhood (loss of one or both parents) were asked at survey rounds 1, 9 and 12 for children under the age of 15. HIV testing was done for all consenting adults at the three time points and for children under 13 at rounds 1 and 12.

Sample size: Not given.

Control group: No; survey of the general population.

Outcomes studied: The impact of the HIV-1 virus on a rural African population; orphan prevalence and seropositivity rates among children and parents over time.

Key results: The overall orphan prevalence increased from 10.4 per cent at survey round 1 to 16.8 per cent and 15.4 per cent at survey rounds 9 and 12 respectively. The loss of a father was more common than the loss of a mother at all three rounds. The prevalence of orphans who had lost both parents increased from 1.3 per cent at survey round 1 to 3.3 per cent at round 9 and round 12. HIV-1 seropositivity rates were significantly higher among orphans than among non-orphans and were higher as well among surviving parents of orphans as compared with parents of non-orphans.

Case, Anne, Christina Paxson and Joseph Ableidinger (2003). Orphans in Africa

Summary: The study used data from 19 Demographic and Health Surveys conducted in 10 countries between 1992 and 2000 to study the living arrangements and school enrolment of orphans and non-orphans in sub-Saharan Africa. The 10 countries accounted for about 50 per cent of the AIDS orphans living in sub-Saharan Africa. The researchers found that orphans lived in poorer households than non-orphans and were significantly less likely than non-orphans to be enrolled in school. Poverty did not explain the lower school enrolment, however: orphans were equally less likely to be enrolled in school relative both to non-orphans as a group and to the non-orphans with whom they lived. Outcomes for orphans depended largely on how closely related they were to the household head. Orphans who lived with distant relatives or with non-relatives were less likely than non-orphans to be enrolled in school. There was no evidence that female orphans were systematically disadvantaged.

Countries: Ghana, Kenya, Malawi, Mozambique, Namibia, Niger, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: Nationally and regionally representative sample.

Methodological approach: Multiple regression analysis.

Sample size: Country samples ranged from 8,339 to 28,888.

Control group: No; surveys of the general population.

Outcomes studied: Orphan rates by age of children; living arrangements of orphans (three mutually exclusive groups: maternal orphans, paternal orphans and double orphans) compared with those of non-orphans; household wealth of orphans and non-orphans; school enrolment of orphans.

Key results: Roughly 10 per cent of the children in the surveys had lost one or both parents. On average, 2.4 per cent of children were maternal orphans, 5.7 per cent were paternal orphans and 2 per cent were double orphans. In most countries, more children had lost a father than a mother. Children who had lost one parent were less likely than non-orphans to live with the surviving parent in all countries examined, and this disparity was more pronounced in later surveys. In Zambia, for example, only 40 per cent of maternal orphans lived with their fathers, as compared with 74 per cent of non-orphans. Orphans on average lived in poorer households than non-orphans, and paternal orphans were the most disadvantaged. In all countries, orphans were more likely to live in households with a higher fraction of elderly persons, with less well-educated heads and with female heads. Orphans of any type were less likely to be in school than non-orphans with whom they lived, and in most countries double orphans were 10 to 30 percentage points less likely to be in school. Lower enrolment was not due solely to orphans' poverty but was explained in part by the relationship of the orphan to the head of household. The probability of school enrolment was inversely related to the closeness of the relationship.

Floyd, Sian, Amelia C. Crampin, Judith R. Glynn, Nyovani Madise, Andrew Nyondo, Masiya M. Khondowe, Chance L. Njoka, Huxley Kanyongoloka, Bagrey Ngwira, Basia Zaba and Paul E. M. Fine (2003). The impact of HIV on household structure in rural Malawi

Summary: The study investigated the impact of HIV on household structure over a period of more than ten years. Earlier results had found that the impact of HIV on adult and child mortality was substantial. The ten-year survival rate was 36 per cent among HIV-positive individuals as compared with 90 per cent among initially HIV-negative individuals; under-five child mortality rates were 46 per cent for children born to HIV-positive mothers and 16 per cent for those born to HIV-negative mothers. Further analysis found substantial impacts on household structure. Marriages in which one partner was HIV-positive in the baseline survey were much less likely to be intact at the follow-up survey. Only about one fifth of spouses were still married to a partner who had been HIV-positive in the baseline survey. Remarriage rates for widows or divorced female spouses were lower for wives of HIV-positive men. Younger women were more likely to remarry, as were women whose marriages had ended in divorce rather than widowhood. For men, there was no evidence of an effect of HIV status on the rate of remarriage. Surviving male spouses were almost always the head of the household in which they were living, regardless of the spouse's HIV status. Widowed and divorced female spouses were much less likely to be household heads, especially if their husbands had been HIV-negative.

Children of the baseline survey respondents who were less than 15 years old at the time of the follow-up survey were much more likely to be alive and resident in the district if their parents had been HIV-negative in the original survey. Among surviving children 18 or under, the per

centage living with neither parent was much higher for those born to HIV-positive individuals. Young adult offspring (aged 15 to 25) who were tested for HIV were found to have about the same prevalence rates regardless of their parents' HIV status at the time of the original survey.

Country: Malawi.

Study area: Karonga district, northern Malawi.

Methodological approach: Retrospective cohort study with more than ten years of follow-up. From population-based surveys conducted in the 1980s, 197 "index individuals" aged 14 to 68 were identified as HIV-positive, and 396 HIV-negative index individuals were selected as a comparison group. They were individually matched to the HIV-positive index individuals on the characteristics of age, sex, area of residence, interview date and household structure, and they, together with spouses and offspring, were sought for reinterviews in 1998-2000.

Sample size: 197 HIV-positive individuals and 396 HIV-negative individuals.

Control group: Yes.

Outcomes studied: The impact of HIV status on the spouses of infected individuals in terms of widowhood, remarriage and their relationship to household head. The impact of HIV status on the offspring of infected individuals in terms of living with parents, relationship to household head, dependency ratio in the household, marital status and age at first marriage.

Key results: Only one in five marriages in which one partner was HIV-positive at the baseline survey was still intact at the follow-up survey; remarriage rates for widows or divorced female spouses were lower for wives of HIV-positive men; remarriage rates for men did not seem to be affected by the HIV status of their wives at the baseline survey; children of HIV-positive parents were much less likely to be alive and resident in the district at the follow-up survey than children of HIV-negative parents; among surviving children 18 or under, those whose parents were HIV-positive at the initial survey were much more likely to be living with neither parent at the follow-up survey.

Gertler, Paul, David Levine and Sebastian Martinez (2003). The presence and presents of parents: do parents matter for more than their money?

Summary: The study examined the effects of the death of a parent on investments in the health and education of surviving children in Indonesia. Parental loss is hypothesized to operate on child investment through a reduction in household resources and removal of parental presence, including loss of mentoring, transmission of values and emotional and psychological support. The study found that children who had lost a parent were less likely to be in school and were less healthy than children whose parents had lived. However, the reduction in economic resources measured by the change in household consumption explained only a small portion of the effect of parental death. Parental presence in the household is thought to play an important role in investments in child human capital.

Country: Indonesia.

Study area: 312 communities in 13 provinces in Indonesia.

Methodological approach: Data from the 1993 and 1997 rounds of the Indonesia Family Life Survey (IFLS) were used; variables included school enrolment status, schooling history, anthropometric data, household and community-level variables, household consumption and adult deaths. Six regression models with random and fixed effects were specified.

Sample size: 6,185 children in 3,378 households.

Control group: Survey of the general population; comparisons between orphaned children and others.

Outcomes studied: Changes in household consumption; school enrolments and dropouts; changes in child health and nutritional status (mortality, height for age, weight for age, weight

for height, body mass index, stunting and wasting).

Key results: Among children who lost a parent, those with deceased fathers were more likely to drop out of school, whereas those whose mothers had died were less likely to start school. Children in households with higher consumption and children with educated and healthy mothers were more likely to start school than others. Children whose mothers had died were more likely to die than those who had not lost a parent. Paternal death had no effect on children's health, but the effect of maternal death was large and statistically significant, especially for measurements related to weight. Bereaved children were generally less healthy than children whose parents had lived.

Hosegood, Victoria, Kobus Herbst and Ian Timæus (2003). The impact of adult AIDS deaths on households and children's living arrangements in rural South Africa

Summary: The AIDS epidemic is now well advanced in sub-Saharan Africa, but studies of the impact of AIDS mortality on households and communities are still scarce. South African rural households are characterized as very fluid social units, presenting a complex range of forms and development cycles. The data-collection system of the Africa Centre Demographic Information System (ACDIS) is designed to reflect social dynamics and residential mobility. The study explores the impact of young adult deaths on household dissolution, composition, migration and the co-residency arrangements of household members, as well as the patterns of care, education and welfare for children orphaned as a result of the adult deaths. The study found that households with an adult death were much more likely to dissolve than other households, but that migration of household members was more likely than migration of the whole household. Generally, households were unable to replace members who died; both the death of a household member and the out-migration of surviving members caused a decrease in household size. Children under 15 in households with an adult death were more likely to migrate during the year, especially if a parent had died. The movement and fostering of children in response to difficulties was a common strategy in rural South Africa even before the HIV/AIDS epidemic.

Country: South Africa.

Study area: Rural district of Umkhanyakude in northern KwaZulu Natal.

Methodological approach: ACDIS longitudinal data collected every four months for one year (2000-2001) from 10,490 households constituted the data set. Multivariate hazard models were used to analyse the impact of young adult deaths on household structure.

Sample size: 10,490 households in rural KwaZulu Natal.

Control group: Longitudinal survey of the general population; comparisons between households that experienced an adult death and other households.

Outcomes studied: The impact of young adult deaths on households; arrangements for caring for children orphaned as a result of the adult deaths.

Key results: Household instability (dissolution and migration) was significantly associated with younger heads, female heads and death of a household member. Five per cent of households experienced at least one AIDS death during the one-year observation period, and they were nearly three times as likely to have dissolved by the end of the year than other households. Only a very small number of child-headed households was found.

Janjaroen, W. (1997). The impact of AIDS on household composition and consumption in Thailand

Summary: The paper examines two questions: (a) what is the household structure and composition in households with and without an adult death? and (b) among households with and without an adult death, what are the factors affecting the change in household consumption?

Country: Thailand.

Study area: Five districts in Chiang Mai Province in the upper north of Thailand: Mae Rim, San Sai, San Kamphaeng, Hang Dong and Fang districts.

Sample: A total of 361 households were interviewed: 116 households with a death from AIDS, 100 households with a death from another cause and 108 households with no death.

Methodology: Selection of sample households with AIDS deaths and non-AIDS deaths from among those deaths that had occurred in the public health facilities. A sample without a death was also identified. A survey questionnaire was administered to each household. The household respondent was either the household head or his/her representative who could provide the information.

Control group: Yes.

Outcomes studied: Household structure and composition and household consumption.

Key results: The average household size for households with a death resulting either from AIDS or from other causes was smaller than that of households without any death (3.1 versus 4.0). The results suggest that the households without deaths had higher consumption levels than those with deaths, but the differences between the two groups were very small and not statistically significant. The regression analysis showed that, after controlling for other variables, AIDS deaths had a larger negative impact on consumption than did deaths from other causes. The association remained after controlling for the duration of the illness.

Knodel, John, Wassana Im-em, Chanpen Saengtienchai, Mark VanLandingham and Jiraporn Kespichayawattana (2002). The impact of an adult child's death due to AIDS on older-aged parents: results from a direct interview survey

Summary: The study describes the methodology and findings of a direct interview survey in Thailand of parents of deceased adult children who died of AIDS and a comparison group of older-age parents who had not suffered such a loss. The results provide extensive information on living arrangements, parental caregiving, health impacts, spouses and orphaned children; care, treatment and funeral expenses; longer-term economic impacts; and community reaction. The detailed results show considerable diversity in the extent to which parents are impacted. Clearly, personal caregiving and instrumental assistance by parents, especially the mother, can be very demanding. Even when a parent is a main caregiver, other family members, particularly other adult children, often assist the parental caregiver. Parents also often serve as critical links between their ill adult child and the health-care system. Caregiving often takes a toll on the emotional and physical health of the parental caregiver at the time care is being provided. Only a minority of the AIDS parents had fostered grandchildren left behind by their deceased son or daughter. Overall, the loss of a child to AIDS has a serious economic impact for only a minority of AIDS parents. At the same time, the poor appear to be the most adversely affected. Sustained social stigma directed at parents of persons who died of AIDS is far from universal in Thailand at present. Sympathetic and supportive reactions from others in the community are more frequently reported than negative ones (authors' abstract).

Country: Thailand.

Study area: Chiang Mai, Rayong and Phichit provinces.

Methodological approach: Direct interview survey of parents of adult children. Sites were chosen on a purposive basis and included both rural and urban areas. Health personnel in each district chose suitable sites and identified households that had experienced an AIDS death and households with persons of comparable age, marital status and economic background who had at least one living adult child and who had not experienced a recent death among their children.

Sample size: Interviews were conducted with 394 AIDS parents and 376 non-AIDS parents. Information provided about spouses meant that the interviews generated data for 649 AIDS parents and 621 non-AIDS parents.

Control or comparison group: Yes.

Outcomes studied: Impact on older parents of the illness and AIDS-related death of an adult child compared with parents who suffered no such death; role of parents in caregiving and seeking health services for their ill child; economic consequences of child's illness and death; and effects on parents of the social stigma related to AIDS.

Key results: Overall, the loss of a child to AIDS has a serious economic impact for only a minority of AIDS parents. At the same time, the poor appear to be the most adversely affected. In Thailand at present, sustained social stigma is not universally directed at the parents of persons who died of AIDS. The impact of losing a potential provider of care in old age may not become apparent until long after the adult child's death. However, most AIDS parents had other children to help with their care in old age.

Knodel, John, and Wassana Im-em (2002). The economic consequences for parents of losing an adult child to AIDS: evidence from Thailand

Summary: In the paper the authors examined the economic consequences for parents of losing an adult child to AIDS in Thailand, with an emphasis on the effects of parental caregiving. Their main findings are as follows: (a) parents were frequently and substantially involved in the payment of care and treatment costs, but government health insurance and, to a lesser extent, welfare helped alleviate the financial burden this created; (b) only a minority of AIDS parents fostered grandchildren left behind by their deceased son or daughter; (c) most deceased children had contributed financially to the parental household before becoming ill, but only a minority had been main providers. However, poor parents were far more likely than better-off parents to lose a main provider and for this to create severe financial hardship; and (d) poorer parents spent much less money than better-off parents on expenses, but the burden created by expenses was far greater for poorer than for better-off parents. One important implication of these findings is that programmes are needed that recognize and address the plight of older persons who lose a child to AIDS. The programmes need to take into account the considerable range of vulnerability that exists and target those who are particularly susceptible to resulting economic hardship (authors' abstract).

Country: Thailand.

Study areas: Key informant study: Bangkok and eight provinces; direct interview survey: Chiang Mai, Rayong and Phichit provinces; open-ended interviews: Bangkok and three provinces.

Methodological approach: The analysis draws on three data sets that were collected as part of a comprehensive study of the impact of the AIDS epidemic on older persons in Thailand. The sources of data are based on different methodological approaches: interviews with key informants about individual AIDS cases and their families; direct survey interviews with parents whose adult child had died of AIDS and parents with similar characteristics who did not experience the death of an adult child; and open-ended interviews with AIDS parents. The first two were designed to yield data suitable for quantitative analysis and the third to yield data suitable for qualitative analysis. Neither of the first two surveys was based on a probability sample. Informants were identified by health personnel.

Sample size: Data for 768 adults who died (including 258 for whom supplemental information was also collected) were obtained through interviews with key informants, most of whom were staff or volunteers at local health centres; interviews with 394 AIDS parents and 376 comparison parents generated data on 649 AIDS parents and 621 comparison parents; open-ended interviews were conducted with 19 AIDS parents.

Control or comparison group: Yes, in direct survey interview portion of the study.

Outcomes studied: Economic consequences for parents of losing an adult child to AIDS.

Key results: Older Thai parents were extensively involved with their infected adult children through both living and caregiving arrangements. Return migrants constituted a substantial share (32-40 per cent) of adult children with AIDS for whom parents provided care during the terminal stage of

illness. Parents bore substantial financial burdens for an adult child who died of AIDS. They included costs of caregiving; medical costs for treatment; disruption of their own economic activities; and funeral costs. Costs to parents were moderated by government health insurance and welfare and by membership in funeral societies. Poor parents spent less on expenses than better-off parents, but the burden of expenses was more likely to create financial hardships for poor parents. Overall, the loss of a child to AIDS had a serious economic impact for only a minority of AIDS parents in the sample.

Menon, Rekha, Maria J. Wawer, Joseph K. Konde-Lule, Nelson K. Sewankambo and Chuanjun Li (1998). The economic impact of adult mortality on households in Rakai district, Uganda

Summary: The study assesses the economic impact of adult mortality on households in the Rakai district in southwestern Uganda. An issue of concern, especially in the case of the AIDS epidemic, is the impact of a "shock" to the household caused by the death of an economically active adult. The death of an economically active adult may result in changes in household size and composition and a decline in the household's socioeconomic status. In response to the shock of a fatal adult illness like HIV/AIDS, households may liquidate their assets to pay for medical treatment and funeral costs. Using information regarding adult mortality in households between 1989 and 1992 in the Rakai district of Uganda, this study attempts to provide a better understanding of the impact of an adult death on a household's composition, size and economic status.

Country: Uganda.

Study area: Rakai district.

Sample: The analysis focuses on the 1,945 households that were enrolled in the study, beginning in 1989-90 and followed until 1992.

Control group: Longitudinal survey of the general population; comparisons between households experiencing an adult death and other households.

Methodology: A longitudinal sero-epidemiological study was conducted between 1989 and 1992 in the Rakai district in southwestern Uganda.

Outcomes studied: Household composition and household ownership.

Key results: Households affected by an adult death altered their size and composition. Households with an adult AIDS death incurred economic losses through a depletion of some durable goods. Households in which the deceased was male were seven times more likely to suffer a reduction in ownership of durable goods than households where the deceased was female. It is possible that this effect was due to a loss in income in the household as a result of the death of an economically active adult.

Monasch, Roeland, and Nigel Snoad (2003). The situation of orphans in a region affected by HIV/AIDS

Summary: About 11 million children under the age of 15 have lost their mother, father or both parents to AIDS in sub-Saharan Africa, and the number is expected to double by 2010. The study examined data in 40 sub-Saharan countries and looked at living arrangements of orphans and characteristics of households where they live. Nearly one third of single-parent orphans were found to be living apart from their remaining parent. The impact of orphanhood on children was explored by analysing data on school attendance, nutritional status and child labour. The study found that living arrangements of children in countries with high HIV-prevalence rates differed significantly from those in other countries. Families and communities were generally responsible for the care of orphans in the countries most affected by HIV/AIDS. The composition of the households in which orphans lived was found to differ from one country to another. Overall, orphans were found to have less schooling and to be more involved in child labour than other children.

Country: Forty countries in sub-Saharan Africa.

Methodological approach: Cross-national comparison of data from nationally representative population-based surveys conducted between 1997 and 2001. Surveys included Multiple Indicator Cluster Surveys (MICS), organized by UNICEF, and Demographic and Health Surveys.

Sample size: Samples ranged from 6,200 children in Sao Tome and Principe to 66,345 children in northern Sudan. Average survey size was 18,474 children.

Control group: Surveys of the general population; comparisons between orphans and other children.

Outcomes studied: Living arrangements of AIDS orphans and characteristics of households where they live; school attendance, nutritional status and child labour status of AIDS orphans.

Key results: The death of parents had significant implications for orphans in terms of households and living arrangements and well-being. Orphans were less likely to attend school than non-orphans, especially in countries with lower overall school attendance. Orphanhood did not seem to be associated with being malnourished in most countries.

Mushati, P., S. Gregson, M. Mlilo, J. Lewis and C. Zvidzai (2003). Adult mortality and the economic sustainability of households in towns, estates and villages in AIDS-affected Eastern Zimbabwe

Summary: The study examined the consequences of adult terminal illness and death for households in eastern Zimbabwe. In a country with an HIV prevalence rate exceeding 20 per cent, little information was available about the effects on households of an extended period of crisis mortality. Primary caregivers of deceased adults were interviewed about household income, expenditure on health care and funeral expenses, asset sales and relocation after the death. The study found that heavy expenditure, substantial loss of income and erosion of capital assets were associated with the terminal illness and death of an adult household member. The expenses were seriously undermining the economic viability of households in the principal socio-economic strata in eastern Zimbabwe. Households in subsistence farming areas were found to be bearing the brunt of the epidemic and were faced with deepening poverty.

Country: Zimbabwe.

Study area: Small towns, large-scale commercial farming estates and subsistence farming villages in Manicaland, Zimbabwe's eastern province.

Methodological approach: Interviews with primary caregivers of the deceased for deaths occurring between the 1998-2000 and 2001-2003 rounds of a stratified household census and cohort study.

Sample size: 133 male and 135 female adult deaths (final sample size expected to be approximately 320).

Control group: No.

Outcomes studied: Household income, expenditure on health care and funeral expenses, asset sales and relocation after adult death in household.

Key results: Results showed that most of the deceased (78 per cent) were the predominant income earners for their households. More men than women had been in formal sector employment; 60 per cent lost their jobs during their illness. The sick person and his/her spouse paid 42 per cent of health-care costs and 41 per cent was paid by other household members. One in seven caregivers gave up a job to care for the sick person, and about one in four households relocated within a few months of the adult death.

Mutangadura, G. (2000) Household welfare impacts of mortality of adult females in Zimbabwe: implications for policy and program development

Summary: The HIV/AIDS epidemic in Africa is increasingly becoming one of the major impediments to sustainable development. Zimbabwe is one of the southern African countries that is severely affected by the HIV/AIDS epidemic, which has already reversed hard-won gains on national health. At the global level, 46 per cent of the 33.6

million people currently living with HIV/AIDS are women. The trend in the proportion of females living with HIV/AIDS to the total adult population living with HIV/AIDS has increased in the past three years, according to the study. Since women are the gatekeepers of household food security and are key players in the overall household economy, it is important to find out the welfare impact of female mortality at the household level. In times of tightening national budgets and declining national resource allocation to social services, understanding how households respond to the death of an adult female is important. Such an understanding can help ensure that interventions aimed at assisting affected households and communities complement and strengthen people's own inventive solutions rather then substitute for or block them. The study describes the major household impacts of female mortality in Zimbabwe and identifies the household coping mechanisms adopted and the current formal and informal social support mechanisms. Findings indicate that the major household welfare impacts of adult female mortality were food insecurity, decrease in access to school, increased work burden on children and loss of assets. Empirical evidence from the research also indicates that elderly women have become the leading foster parents of surviving maternal orphans. The study also reveals that households are more dependent on informal sources of support to help cushion the impacts of premature adult female mortality. The report considers ways in which macroeconomic policies have aggravated conditions, resulting in the weakening of informal sources of support. The article suggests policy response options that can be used to strengthen the capacity of surviving households to cope with the impact of mortality of adult females. Such policy implications focus on intensification and expansion of national support to secondary education for orphans, support to the elderly and strengthening of community initiatives so as to generate substantial positive welfare effects by complementing the informal devices.

Country: Zimbabwe.

Study area: Manicaland province: one urban area (Mutare) and one rural area (Maranga).

Methodological approach: Household interview retrospective survey and focus group interviews.

Control or comparison group: No.

Sample size: 215 households fostering maternal orphans were interviewed.

Outcomes studied: Child schooling, health, food security and asset base.

Key results: About 40 per cent of the interviewed households had orphans who had lost both parents. Sixty-five per cent of the households where the deceased adult female lived before her death were reported to be no longer in existence in both the urban and rural sites. Most of the foster parents were grandparents (50 per cent in urban areas and 52 per cent in rural areas), and most grandparents were maternal grandparents (65 per cent). Of the total foster household heads, 62 per cent were women, with the proportion being higher in the urban site. Of the female-headed foster households, 60 per cent were headed by grandparents, 25 per cent by other relatives, 13 per cent by adult children and 2 per cent by children. In addition, 40 per cent of the female foster heads were aged 60 and above.

Nyamukapa, C., S. Gregson and M. Wambe (2003). Extended family childcare arrangements and orphan education in Eastern Zimbabwe

Summary: The study looked at arrangements for extended-family care of orphans and non-orphans in eastern Zimbabwe and their influence on primary school completion. The researchers found that, despite their being overrepresented in poor households, paternal orphans were no less likely to have completed primary school than non-orphans of the same age. However, fewer maternal orphans had completed primary school. The evidence suggested that extended family and external support was greater for widow-headed households than for widower-headed households, and that widowed mothers gave higher priority to their children's education than did widowed fathers. Extended-family care for orphans was

found to be under stress as the number of orphans continued to increase, and the results suggested that programmes to support extended-family care should be strengthened, especially in the rural communities where families typically bring up orphans.

Country: Zimbabwe.

Study area: Manicaland, eastern Zimbabwe.

Methodological approach: Statistical analysis of data on parental survival, household circumstances and school education from a socio-economic, location-stratified population census; systematic analysis of qualitative data on extended family-care arrangements and children's education from in-depth interviews with a purposive sample of children and caregivers, government and non-governmental organization representatives and community leaders.

Sample size: Statistical analysis done for population census of 14,372 children under the age of 15; in-depth interviews conducted with 48 pairs of children and caregivers stratified by gender and current orphan status.

Control group: Non-orphans were compared with three types of orphans (paternal, maternal and double orphans).

Outcomes studied: Family-care arrangements for orphans and non-orphans; primary-school completion rates for orphans and non-orphans.

Key results: The average age of all types of orphans was two to three years higher than non-orphans, and orphans were found disproportionately (relative to adult HIV prevalence) in rural business centres and subsistence farming areas. Children who had lost their mothers were less likely to have completed primary school than were non-orphans and children who had lost their fathers. Orphan-care arrangements vary considerably in Zimbabwe but still take as a common model an extended-family childcare system. However, this system is being eroded by socio-economic change and high HIV-related adult mortality.

Pitayanon, Sumalee, Sukontha Kongsin and Wattana S. Janjaroen (1997). The economic impact of HIV/AIDS mortality on households in Thailand

Summary: The main objective of the study was to measure and analyse the economic impact of adult HIV/AIDS-related deaths on rural Thai households in an area with a large number of reported HIV/AIDS cases. The study measured the size and significance of the economic impact of a death after all coping strategies had been employed. It investigated differences in impact between AIDS-related deaths and adult deaths from other causes, and it examined links between adult AIDS mortality and poverty. It also analysed the ability to cope with respect to the socio-economic characteristics of the household.

Country: Thailand.

Study area: Rural areas in five districts of Chiang Mai province in northern Thailand.

Methodological approach: Cross-sectional, retrospective data from a survey of rural households that experienced the death of a working adult; the methodology is similar to that employed in World Bank studies in Africa. Households were selected from hospital records of AIDS-related deaths during 1992 and 1993. Both the direct and indirect costs of an HIV/AIDS-related death were calculated.

Sample size: 116 households with a recent adult AIDS-related death; 100 households with a recent adult death not related to AIDS; and 108 households where no death had occurred.

Control or comparison group: Yes.

Outcomes studied: Socio-economic impact of adult HIV/AIDS-related deaths at the household level in rural Thailand; difference between AIDS death and non-AIDS death; links between adult AIDS mortality and poverty; coping ability of households with different socio-economic characteristics.

Key results: Rural households that experienced an AIDS-related death were mainly from the lowest

income and least-educated group, and most were engaged in agricultural work and labour. The impact of an AIDS-related death on the household was substantial and was greater than the impact of a death from other causes. Households coped with AIDS illness and death by spending savings, selling assets, reducing consumption, reallocating the time of household members to make up lost income, withdrawing children from school to help with chores and to work, borrowing money, receiving support from relatives and using services from non-family institutions. Most poor households received little help from non-family institutions. The burdens of AIDS-related deaths fall disproportionately on the poor and contribute to the increasing inequality of income distribution in Thailand. The evidence suggests that an adult AIDS death threatens a household's welfare and survival and that AIDS interventions must focus on the growing needs of the infected person's family and the community as a whole.

Rossi, M.M., and P. Reijer (1995). Prevalence of orphans and their education status in Nkwazi compound - Ndola

Summary: The study aimed at measuring the prevalence of orphans and their education status in Nkwazi compound, Ndola, in Zambia. It also assessed the attitude of the community towards orphans. The study showed that orphaned children had lower school attendance than non-orphans. The extended family system was also the only system that cared for orphans, and the majority of the carers found difficulties with the added responsibility; the major problems being lack of clothes, money for school fees and food.

Country: Zambia.

Study area: Nkwazi compound, in Ndola district.

Sample: 250 households.

Methodological approach: retrospective survey of 250 households selected among 10 sections in the community.

Outcome studied: school attendance, living arrangements.

Key results: Out of the 250 households surveyed, 81 (32 per cent) had orphans, and out of a population of 909 children, 192 (21 per cent) were orphans, of which 22 per cent were double orphans. Of the 149 single orphans, 24 per cent were maternal orphans and 76 per cent were paternal orphans.

Out of 140 orphans of school-going age, only 46 per cent were attending school as compared with 56 per cent of non-orphans.

Fifty-three (65 per cent) of the guardians of the orphans said that they had added responsibilities owing to the presence of an orphan in the family, with 27 per cent mentioning a lack of money as the problem, 22 per cent as having problems with school fees, 35 per cent mentioning food and 37 per cent mentioning clothes as their main problem.

Only 5 per cent of the 81 households with an orphan said that they received support from others in the community. Support came mostly from other relatives and the church.

Suliman, El Daw (2003). HIV/AIDS effects on AIDS orphans in Tanzania

Summary: The study produced new estimates of the number of AIDS orphans in the United Republic of Tanzania. About 921,000 children were estimated to be AIDS orphans as of 2000, or nearly 6 per cent of all children aged 0 to 15. The study also investigated the levels of child labour and child schooling and found significantly more orphans than non-orphans engaging in paid labour and significantly fewer orphans enrolled in school. Orphans were found to have school participation rates an average of 4 percentage points lower than those of non-orphans and rates of participation in paid labour an average of 9 percentage points higher. As orphans enter the labour force, they will be less well educated than non-orphans and are likely to be less productive. The large number of orphans will reduce the pool of qualified candidates for jobs in the Government and in the private sector.

Country: United Republic of Tanzania.

Study area: National samples.

Methodological approach: Modified life-table approach for estimates of AIDS orphans; logistic regression models on the effects of orphanhood on schooling participation.

Sample size: A total of 5,184 households in the United Republic of Tanzania (Mainland Tanzania and Zanzibar) from the Tanzania Human Resource Development Survey (HRDS); 8,327 households from the 1992 Tanzania Demographic and Health Survey; and 3,615 households from the 1999 Tanzania DHS.

Control group: Surveys of the general population; comparisons between orphans and other children.

Outcomes studied: Validation of estimates of the number of AIDS orphans in the United Republic of Tanzania; orphan versus non-orphan differences in child labour (work for pay, unpaid family work and help with household chores) and child schooling (enrolment rates and drop-out rates); and projections of the effect of orphanhood on future labour markets in the United Republic of Tanzania.

Key results: Single-parent orphans were twice as likely as non-orphans to have ever worked for pay, and dual orphans were more than ten times as likely to have worked for pay. Orphans were significantly less likely to attend school (orphanhood lowered the odds of attending school by 45 to 64 per cent) and were more likely to drop out as compared with non-orphans. Orphans were also more likely to work while attending school than non-orphans. The 1999 DHS data showed school attendance rates 5-10 percentage points lower for orphans than non-orphans and participation rates in paid work 5-10 percentage points higher for orphans.

Yamano, Takashi, and T.S. Jayne (2002). Measuring the impacts of prime-age adult death on rural households in Kenya

Summary: The study assessed the effect of prime-age adult mortality on rural household size and composition, agricultural production, asset levels and off-farm income. Mortality was calculated by using adult mortality rates from an HIV-negative sample from the neighbouring United Republic of Tanzania to predict the number of deaths that might have been expected in Kenya in the absence of HIV. The results indicated that AIDS accounted for a large proportion of the recorded deaths of males and females in the prime ages, particularly in the Nyanza region. Households with an adult death were compared with those that had no adult death. The effects were found to be highly sensitive to the gender and position of the deceased family member, with the most serious effects found when the male head of household died. Crop production declined, particularly such cash crops as coffee, tea and sugar, and off-farm income was significantly affected by the death of the male head. There was little indication that households were able to recover quickly from the effects of the adult death.

Country: Kenya.

Study area: 22 districts in the eight agriculturally oriented provinces.

Methodological approach: Household surveys in 1997 and 2000 using a two-year panel; household fixed-effects model that controls for time-varying effects to measure changes in outcomes between households with an adult death and those without an adult death during the three-year survey period.

Sample size: 1,422 households.

Control group: Surveys of the general population; comparison of households experiencing an adult death to other households.

Outcomes studied: Effect of prime-age adult mortality on size and composition of rural households, agricultural production, asset levels and off-farm income.

Key results: The death of the head of household or spouse resulted in a reduction of household size greater than one person; the death of a male household head aged 16 to 59 was associated with a 68 per cent reduction in the value of the household's crop production; off-farm income was significantly affected by the death of the male head

of household but not by the death of other adult members; households did not recover quickly from prime-age head-of-household adult mortality.

B. STUDIES ON FIRMS

Aventin, Laurent, and Pierre Huard (1997). HIV/AIDS and business in Africa: a socio-medical response to the economic impact? The case of Côte d'Ivoire

Summary: Using the findings from research carried out from 1995 to 1996 on the economic impact of HIV/AIDS on three firms in Abidjan, the researchers looked into the companies' reactions to the dysfunction caused by the epidemic. Two categories of costs were identified: the observable and quantifiable costs (absenteeism for health reasons, the costs of medical care and falling productivity); and the less quantifiable effects of HIV/AIDS, such as the increasing disorganization of work.

The study was based on cases of HIV infection reported by each establishment's resident physician. The method thus excluded cases of seropositivity among staff members not known to the company doctors. The research varied from one firm to another owing to the nature and quality of the information available for a retrospective study. The study involved repeated interviews with company doctors, chief executives, personnel managers, chief accounting officers, other managerial and supervisory staff and workers. Other information from outside the three firms was obtained from members of associations for HIV-infected persons, trade unions and insurance companies.

Country: Côte d'Ivoire.

Study area: Three firms in the city of Abidjan.

Methodological approach: Repeated interviews with company personnel and workers. The study is based on cases of seropositive employees whose infection was reported by each establishment physician.

Outcomes studied: Costs of medical care and falling productivity.

Key results: Over the period for which records were reviewed, which ranged from 1989-1995 to 1993-1995 in the three firms, employees known to be infected with HIV made up between 1 and 3 per cent of the firms' average number of employees. Between 57 and 80 per cent of the HIV-infected employees had already died. Quantifiable monetary costs to the firms depended heavily on the health and death benefits offered by the employer. The highest direct costs were incurred during the employees' morbidity phase.

Baggaley, R., Peter Godfrey-Faussett, Roland Msiska, Diane Chilangwa, Eusabio Chitu, John Porter and Michael Kelly (1994). Impact of HIV infection on Zambian businesses

Summary: In the study, the personnel managers of 21 companies with a total workforce of 6,447 people in Lusaka and in towns in the Copperbelt were visited by the study team. A questionnaire on mortality, productivity and recruitment in the 21 companies was completed by the managers for the period from 1987 to 1992, using company records. All 21 questionnaires were returned. HIV was felt to have affected productivity in 48 per cent of the companies and recruitment in 19 per cent. Some 14 per cent of the companies knew of employees who were infected with HIV. The crude death rate increased from 0.24 per cent in 1987 to 1.6 per cent in 1992 and was predicted to be 2.1 per cent in 1993.

Most deaths were due to unknown causes, though deaths from tuberculosis, diarrhoea and AIDS were recorded with increasing frequency.

Country: Zambia.

Study area: Lusaka and towns in Copperbelt.

Methodological approach: A questionnaire on mortality, productivity and recruitment in the 21 companies was completed by managers for the period from 1987 to 1992, using company records.

Outcomes studied: Death rate.

Key results: The crude death rate among employees increased from 0.24 per cent in 1987 to 1.6 per cent in 1992 and was predicted at 2.1 per cent in 1993.

Bersufekad A. (1994). A study on the socio-economic impact of HIV/AIDS on the industrial labour force in Ethiopia

Summary: In the study, conducted in Ethiopia, 15 different establishments were surveyed. Data on the incidence of HIV/AIDS among the employees of those establishments were collected over the five-year period 1989-1993 from the clinics owned by the establishments. Data were also collected on the occupations of employees and the types of firms. Data on absenteeism and medical costs were collected. It was found that 53 per cent of all illnesses accounted for were HIV/AIDS-related. Although there was a possibility of a selection bias since not all infected employees were known by the companies (some may have chosen to go to private clinics to ensure the confidentiality of their status), the study showed that HIV/AIDS-related illnesses were on the rise.

Country: Ethiopia.

Methodological approach: Firms were surveyed from 1989 to 1993 and data on HIV incidence among employees were collected along with data on absenteeism and medical costs to the firms.

Key results: It was found that 53 per cent of all illnesses accounted for were HIV/AIDS-related. That may be an underestimate, since not all infected employees were known to the companies.

Clancy, P. (1998). The economic impact of AIDS at firm level in Tanzania

Summary: The study measured the medical costs paid by six firms in the United Republic of Tanzania from 1993 to 1997, based on company records. Although the cause of illnesses is not known in most of the cases, the study showed that medical costs increased 3.5 to 5 times between 1993 and 1997 in the six firms.

Country: United Republic of Tanzania.

Study area: Six firms.

Methodological approach: Collection of information on medical costs at the firm level.

Outcomes studied: Medical costs.

Key results: The study showed that medical costs increased 3.5 to 5 times between 1993 and 1997.

Forgy, L. (1993). The economic impact of AIDS in Zimbabwe

Summary: Using simple economic simulation models with and without AIDS, the study predicted the impact of AIDS on the mining industry in Zimbabwe and showed that the costs resulting from AIDS would increase 12 times from 1995 to 2010. Assumptions were made on the prevalence of HIV in the mining industry and on how it affected the industry. The same study was replicated for Zambia as well. The goal of the study was to predict the impact of HIV/AIDS on the economy at large. The model incorporates demographic, health and human capital variables.

Country: Zimbabwe.

Study area: Mining industry.

Methodological approach: Simple simulation models incorporating demographic, health and human capital variables.

Outcomes studied: Costs of AIDS.

Key results: Prediction of a 12-fold increase of the costs of AIDS to the mining industry between 1995 and 2010.

Fox, Matthew, Sydney Rosen, William MacLeod, Monique Wasunna, Margaret Bii, Ginamarie Foglia and Jonathon Simon (2003). The impact of HIV/AIDS on labour productivity in Kenya

Summary: The impact of HIV/AIDS on individual labour productivity during the progression of the

disease is not well known. The study examined the productivity and attendance at work of 54 tea-estate workers who died of AIDS-related causes between 1997 and 2002 in western Kenya. The results showed that productivity declined as AIDS progressed, especially in the last year before death. The empirical estimates of the impact of HIV/AIDS were probably understated, since workers often brought unrecorded "helpers" to assist them and prevent them from losing their jobs.

Country: Kenya.

Study area: Kericho district, Rift Valley province.

Methodological approach: The researchers used a retrospective cohort design. They collected data from company hospital records and records of daily productivity, including daily output in kilograms of tea leaves plucked, use of paid and unpaid leave and assignment to less strenuous tasks by workers who died of AIDS over a 36-month period. They then compared the data with a control group of workers still in the workforce, matching them on time and tea field.

Sample size: 54 tea-estate workers who died of AIDS-related causes.

Control group: Yes; workers still in the workforce.

Outcomes studied: Labour productivity of HIV/AIDS-affected workers in a tea estate as measured by kilograms of tea leaves plucked per day, amount of leave (sick leave, annual leave and unpaid leave) used and days spent doing less strenuous tasks; changes in productivity as the disease progressed.

Key results: HIV-positive workers plucked significantly less tea than those in the control group. In their last two years of life, workers who ultimately died of AIDS produced roughly one-third less tea than other pluckers. Their earnings declined by more than 18 per cent during their last year of life. They also used significantly more leave in the three years preceding death. The quantity of tea plucked declined and the use of leave time increased as they became closer to death. They also spent more days than control workers performing less strenuous tasks. HIVAIDS-related morbidity affected worker performance for at least three years before death.

Ntirunda, M., and Y. Zimda (1998). The impact of HIV/AIDS on production: the experience with Lonhro companies, Malawi

Summary: The study was conducted in Lonhro companies in Malawi in 1991/1992 and 1995/1996. Information was collected on deaths in service during the two periods and the amount of money paid as death-in-service benefits during the two periods. The study showed that deaths in service increased from 1.3 per cent of the pension members to 1.9 per cent from 1991/1992 to 1995/1996, an increase of 40 per cent in a five-year period.

Country: Malawi.

Study area: Lonhro companies.

Methodological approach: Information collected on deaths in service during the two periods and the amount of money paid by the companies as death-in-service benefits.

Outcome studied: Mortality rate and money paid.

Key results: Deaths in service increased from 1.3 per cent in 1991/1992 to 1.9 per cent in 1995/1996. The amount of benefits paid for deaths in service also increased between the two periods.

Rosen, Sydney, Jeffrey R. Vincent, William MacLeod, Matthew Fox, Donald Thea and Jonathon Simon (2003). The cost of HIV/AIDS to businesses in Africa

Summary: In the high-prevalence countries of sub-Saharan Africa, HIV/AIDS has the potential to raise the cost of labour at the same time that it reduces the number of consumers and impoverishes households. It is thus limiting the profitability of businesses and diminishing their competitiveness in the global marketplace. Information about the potential costs of AIDS to the private sector is essential for determining whether companies have a financial incentive to invest in pre-

vention and treatment interventions. The study used detailed data from six companies to estimate the cost of AIDS to businesses and the benefits of prevention and treatment. The analysis found that such interventions would be profitable for all companies and all job levels. Anti-retroviral therapy would be profitable for most companies and job levels if it could be provided for $400 per patient per year.

Countries: Botswana and South Africa.

Methodological approach: Financial, medical and human resource data were collected from six large enterprises from 1999 to 2001. Information was obtained on sick leave; productivity loss; supervisory time; retirement, death, disability and medical benefits; and recruitment and training of replacement workers. Data were also collected from interviews with managers, examination of company documents and a questionnaire administered to supervisors. Results of voluntary, anonymous and unlinked seroprevalence surveys of the workforce were used to stratify the workforce into relatively homogeneous HIV prevalence subgroups on the basis of job level, age range, sex and legally defined racial group. Regression analysis was used to explore the relationship between AIDS victims and use of sick leave and medical facilities.

Sample size: Six formal-sector companies, selected to represent diverse sizes, locations and industrial sectors, including mining, agribusiness and retail.

Control group: No.

Outcomes studied: The study examined the costs of HIV/AIDS associated with individuals: productivity losses from increased sick leave and poor performance on the job, payouts for medical and end-of-service benefits and costs of recruiting and training replacement workers. The present value of incident HIV infections with a nine-year median survival time and real discount rate of 7 per cent was calculated.

Key results: HIV prevalence in the workforces studied ranged from 7.9 per cent to 25 per cent. Costs varied widely across firms and among job levels within firms. The "AIDS tax" varied from less than 1 per cent to 6 per cent of labour costs per year for the companies studied, under a conservative set of assumptions. Investment in prevention and treatment can reduce the tax for most companies and most levels of the workforce and represents a missed profit opportunity for the private sector.

Smith, J., and A. Whiteside (1995). The socio-economic impact of HIV/AIDS on Zambian businesses

Summary: The study was conducted based on data on the number of employees and the number of deaths in Barclays Bank from 1987 to 1992. The average annual death rate of employees was calculated for those years. Information on benefits provided to families of deceased bank employees was also collected for those years, which permitted the calculation of death rates as well as costs of benefits provided to family members.

Problems in estimating the existence of AIDS within the bank were observed. However, there was evidence of an increase in deaths among the employees: 1,155 from 1987 to 1992 (without medical confirmation). Among the causes of death recorded were tuberculosis, pneumonia and unknown. Despite the lack of accurate information on HIV/AIDS cases, assumptions were made based on certain facts and consistencies, which tended to confirm the general view that HIV/AIDS-related cases existed in the bank. Furthermore, statistics showed a concentration of staff deaths in the younger age groups (86 per cent were below the age of 46 years). The impact of AIDS on the bank was calculated based on the expenditures on deceased staff.

Country: Zambia.

Study area: Barclays Bank.

Outcomes studied: Medical expenditures and benefits to families of deceased workers.

Key results: There was an increase in the number of deaths from 1987 to 1992, confirming the impact of AIDS on costs for the bank.

C. STUDIES ON AGRICULTURE

NOTE: In addition to the studies presented below, some of those covered in parts X.A and X.B also concern rural livelihoods.

Barnett, T. (1994). The effects of HIV/AIDS on farming systems and rural livelihoods in Uganda, Tanzania and Zambia

Summary: The study, which was commissioned by the Food and Agriculture Organization, tries to understand the actual and potential impacts of HIV/AIDS on farming systems, especially the estate sector in Zambia. Fieldwork was carried out in 1993, using various participatory methods. The emphasis of the research was on identifying different levels of vulnerability, which is a function of the farming type and the extent of the epidemic. A vulnerability map was produced for Zambia. With vulnerability analysis, the production of an early warning system is possible using three information sources:

- A national broad classification to produce a vulnerability map
- Detailed information from district-level agricultural and administrative sources
- The nature of the impact in specific communities using rapid rural assessment techniques

In Zambia it appears that the most labour-vulnerable farming systems were not immediately vulnerable to the epidemic. In addition, the impact varied widely, making generalization difficult. Matrilineal societies were more vulnerable to labour loss than patrilineal societies. At the time of the study, the impact of AIDS in the Zambian estate sector was limited and was greatest among skilled and educated members of the workforce. An important finding was that the loss of male household members was significant for the management of household economies and the marketing of agricultural produce.

Types of programme activities in relation to agriculture included the following:

- Improvement of returns to labour, as, for example, the use of better storage techniques
- Extension of the planting period
- Crop diversification and reduction of external input requirements
- Cattle and livestock loans, especially for women
- Microcredit schemes

Twenty-seven specific projects were outlined, including pest control, encouragement of better marketing techniques, formation of women's groups, training of orphans in agricultural techniques and crop diversification for income generation.

In intervention programme design, the temporal aspects of the disease and its impact should be considered. HIV/AIDS has three stages: pre-impact, early impact and full impact, as explained below:

- Pre-impact. In this stage, the emphasis should be on (a) health and behavioural education to impede the development of the epidemic, and (b) inclusion in extension messages of clear HIV/AIDS-impact material indicating the types of effects that the epidemic may have on people's livelihoods.

- Early impact. The emphasis should be on health and behavioural education; the development of and support for community-based diagnosis of the current impact; the development and strengthening of existing community support mechanisms; and the development, in consultation with the community, of livelihood and farming adaptations that facilitate labour-economizing activities, technologies and techniques.

- Future impact. In addition to the steps mentioned above, it will be necessary to focus on the development of support

groups for the survivors and ensure that relief assistance is available where necessary.

Countries: Uganda, United Republic of Tanzania and Zambia.

Study area: Estate sector.

Methodological approach: Rapid rural appraisal techniques involving the use of qualitative and quantitative data.

Control group: No.

Sample size: Not applicable.

Outcomes studied: Impact of loss of male household members on household economies.

Key results: At the time of the study, the impact of AIDS in the Zambian estate sector was limited, concentrated mainly on the supply of skilled and educated members of the workforce. An important finding was that the loss of male household members was significant for the management of household economies and the marketing of agricultural produce.

Baylies, C. (1996). Fertility choices in the context of AIDS-induced burdens on households and environment

Summary: Based on fieldwork in agricultural households in Eastern and Lusaka provinces in Zambia the study found that AIDS-affected households tended to concentrate on maize production at the expense of non-staple foods once labour loss was a factor. In addition, livestock and other assets would be sold and the area under cultivation would be reduced. In the field areas, 16-20 per cent of households reported an AIDS death, and the effect of the disease was exacerbated more by the long periods of morbidity of the patient than by the cumulative impact of deaths and changes in household composition. The author noted a tendency to underestimate the impact of AIDS on agriculture in rural communities.

Country: Zambia.

Study area: Eastern and Lusaka provinces.

Methodological approach: Rapid rural appraisal techniques involving the use of qualitative and quantitative data.

Sample: Not applicable.

Control group: No.

Sample size. Not applicable.

Outcomes studied: Maize production and labour loss.

Key results: Shift from non-staple foods to maize production.

Drinkwater, M. (1993). The effects of HIV/AIDS on agricultural production systems in Zambia

Summary: The study included an analysis and field reports of case studies carried out in Mpongwe, Ndola rural district, and Teta, Serenje district. The objectives of the study were, among others:

- To investigate the effect of current health trends, including HIV/AIDS, on agricultural productivity and food security
- To explore how current income-generating activities were being affected by loss of labour in households and how households were adapting (coping strategies)
- To find out how household labour was being affected
- To identify especially vulnerable groups and the impact of labour loss on these groups
- To find out about the people's understanding of health issues and their impact
- To see how existing coping strategies could be strengthened and new ones initiated to support in particular the most vulnerable groups being affected by health problems

- To see how HIV/AIDS prevention and care programmes in the community could be carried out and strengthened

It is common among the matrilineal people who are prevalent across many parts of rural Zambia for an event such as the death of a parent or a divorce to lead to the break-up of the nuclear family itself. Death, like divorce, causes social dislocation. Women move with their children back to the villages of their own mothers or other matrilineal kin, leading those villages to have an increasing number of single-parent producers and a growing dependency ratio.

Country: Zambia.

Study area: Two rural areas; Ndola rural district and Serenje rural district.

Methodological approach: Rapid rural appraisal techniques, involving the collection of qualitative and quantitative data by a multidisciplinary research team.

Both the Mpongwe and Teta surveys began with introductory meetings with farmers, followed by two to three days of detailed interviews, which, once analysed, were built upon through a few follow-up interviews and then final meetings. In both studies, farmers were divided into different groups by gender for the final meeting.

Sample: Not applicable.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: Food security.

Key results: The study found that in Zambia up to 1993, HIV/AIDS was a largely urban phenomenon: at the beginning of the 1990s, 45 per cent of the recorded cases were within the Copperbelt urban centres alone. The pathways of the spread of infection from the main urban centres were the major transport routes, and the carriers were those who used the route regularly—traders, truck drivers and business people. Where those carriers interacted with people from rural areas—for instance, with women marketing crops—HIV/AIDS infection spread into the rural areas. Nodal points could be identified where contact between carriers and rural dwellers was most intense and thus where rural infection rates rose first. The Chipese area, just west of Mpongwe Mission Hospital, was a nodal point of this nature. Chipese was identified specifically as a case study area in the Mpongwe area by AIDS programme staff at Mpongwe Mission Hospital since the area had a high concentration of home-based care patients attended by the hospital—8 patients out of a total of 74.

Haslwimmer, M. (1994). The social and economic impact of HIV/AIDS on Nakambala sugar estate

Summary: A case study of Nakambala sugar estate in Mazabuka district revealed that the impact of AIDS was so far restricted. Even though the man-hours lost from tuberculosis and AIDS accounted for 50 per cent of the total hours lost to illness in the most recent year studied (1992), the cost of absences from tuberculosis and AIDS amounted to only 2 per cent of total labour costs. It was suspected that 75 per cent of the deaths on the estate during the period 1992-93 were AIDS-related. However, in 1992-1993, the sale of sugar reached its peak since the founding of Nakambala, implying that AIDS had up to that point not had a serious impact on production. In fact, the apparent impact of AIDS was mitigated, and the perception of many involved in the sector was that other pressures on production, such as drought and morbidity caused by malaria and diarrhea, were far greater problems than HIV/AIDS.

Country: Zambia.

Study area: Nakambala sugar estate.

Methodological approach: Case study.

Sample: Not applicable.

Control group: No.

Sample size: Not applicable.

Outcomes studied: Man-hours lost.

Key results: The study found that the impact of AIDS was limited up to 1994. Those involved thought that pressures on production were caused by other factors.

Haslwimmer, M. (1994). Is HIV/AIDS a threat to livestock production? The example of Rakai, Uganda

Summary: The study found that one of the serious effects of HIV/AIDS on the farm household was the loss of labour. According to the author, rapid population growth has long been considered one of the greatest problems in Africa. In some rural communities, however, HIV/AIDS is now causing labour shortages for both farm and domestic work. In addition to the loss of labour of the AIDS patient through sickness and subsequent death, family members have to set aside time to care for the sick and, in the end, neglect their farm or off-farm activities, with the subsequent loss of potential income. The situation is aggravated in farming systems with labour peaks during certain times of the year and by a marked gender division of labour, which means that with the death of the husband or wife the spouse does not necessarily take over the work of the deceased. Labour-intensive farming systems with a low level of mechanization and agricultural input are also particularly vulnerable to the impact of HIV/AIDS. In addition, traditional customs, such as the time of mourning, which can last as long as 40 days, depending on the importance of the dead family member and during which no farming activities can be carried out, can adversely affect labour availability.

Country: Uganda.

Study area: Rakai district.

Methodological approach: Rapid rural appraisal techniques.

Sample: Not stated.

Outcomes studied: Changes in ownership of livestock.

Key results: Farmers reported that 10 years ago they had more livestock than today, when about 70 per cent of all households had cattle. The livestock decline is in line with the findings of the land utilization survey conducted in Rakai and Masaka in 1991.

Morris, C., Burdge, D.R. and Cheevers, E.J. (2000). Economic impact of HIV infection in a cohort of male sugar mill workers in South Africa

*Summar*y: The study was undertaken to assess the economic impact of HIV infection in a cohort of rural agricultural workers in South Africa from the perspective of industry. It also projected the medium-term economic impact in that setting based on the known HIV prevalence for the cohort. The study population was 406 rural sugar mill workers, 96 per cent of whom were male. Workers attended an occupational clinic that was provided to them free of charge. They were not prohibited from seeking care at other clinics or privately but had an incentive to utilize the company clinic as it was free of charge and of good quality. All HIV-positive employees who had undergone voluntary testing during the period 1991-1998 were identified. The group included those tested as part of two voluntary sero-surveys undertaken in 1991 and 1996 and those tested on presentation to the clinic with a related illness. In all cases pre-test and post-test counselling was undertaken on site at the clinic. The prevalence data were collected from a saliva-based screen of the whole workforce in January 1999. Ethics approval was obtained from the University of Natal, Durban.

Data were collected from clinic, hospital, insurance and employment records. In the clinic, each visit was documented by a nurse practitioner or physician with a physical exam and diagnosis for each episode. CD4 testing was not routinely done and no prophylaxis for opportunistic infection or anti-retroviral treatment was given during the study period. Hospital records reviewed were those that were part of the workers' clinic chart.

Employment records reviewed were kept at a central site for all employees and included pay grade, age, sex and place of residence. Insurance records were examined for all workers who took ill-health retirement during the time period of the study. From the records, data were extracted on absence from work, hospital stays and clinic visits. Data on the same variables were extracted from a control group of 100 workers not known to be HIV-infected. A saliva-based assay was used to obtain prevalence data on the workforce population. The saliva collection was done on site by a laboratory technician under the supervision of the project manager. The clinical HIV-testing policy of the mill has been one of strict confidentiality between the caregivers and the mill employees. Records do not identify HIV-positive workers, and management at the mill has no mechanism to obtain that information. No HIV testing is done prior to employment, and no prejudicial action may be taken if an employee reveals his status.

In order to determine the costs of illness in the workplace, retrospective data obtained on morbidity and mortality were analysed. Current wage levels and replacement worker costs were determined from payroll databases. Productivity losses from HIV were formulated using industry human-resource estimates. Training costs were estimated from industry standards and human-resource estimates. Hospitalization costs were determined from a review of workplace-based records of payment for workers admitted or workers reimbursed for hospital care. Payment of medical providers was determined from fee-service schedules in the occupational health clinic. A model was formulated projecting prevalence data obtained in the population over a six-year period of disease progression and an incident infection rate of 2 per cent. The natural history of the disease was taken from published reports in Africa. The distribution of clinical disease was determined by clinical information and CD4 counts on a sample of known HIV-infected workers in the study population. Those workers were taken as starting points for disease progression. The cost data were obtained retrospectively and applied to future workforce morbidity and mortality based on the epidemiological data collected. All numbers were calculated in South African rand at 1999 values.

Country: South Africa.

Study area: One rural area sugar mill.

Methodological approach: Use of data collected from clinic, hospital and employment records and a household interview survey.

Sample: Individuals who were HIV-positive.

Control group: Yes.

Sample size: 406 sugar mill workers, of whom 97 were HIV-positive.

Outcomes studied: Costs of illness in workplace, medical expenses, training costs.

Key results: A total of 97 mill workers were seropositive for HIV from 1991 to 1998. Of those, 56 were still in the workforce at the end of December 1998. The HIV-infected workers were exclusively male and had a mean age of 40.6 years and a median age of 40.5 years (range 25-73). A total of 90 per cent of the workers were married and 23 per cent had more than one marriage partner, with an average of 1.36 and median of 1.0. The mean number of dependents per worker was 6.36 with a median of 6.0 (range 1-18). Most workers (60.5 per cent) lived in hostel accommodation on site; the rest lived in the surrounding community. HIV-infected members lost an average of 55 days of work from the illness during their last two years of employment, incurring economic costs of nearly 8,500 rand per worker. Costs to the industry were projected to increase tenfold in the next 6 years.

Rugalema, G. (1999). HIV/AIDS and the commercial agricultural sector of Kenya: impact, vulnerability, susceptibility and coping strategies

Summary: The findings of the study show that the commercial agricultural sector of Kenya is facing a severe social and economic crisis as a result of the impact of HIV and AIDS. Protracted morbidity and mortality have profound financial, economic and social costs for industry. The loss of skilled and experienced labour to the epidemic continues to be a serious concern. If agro-estates

are to remain viable businesses, according to the author, it will be necessary to approach the epidemic with the seriousness it deserves. Measures include well-elaborated prevention programmes and concerted mitigation strategies at the company level in collaboration with other sectors of the economy, including the Government, non-government organizations and civil society.

The findings confirm that the effects of HIV/AIDS on agriculture in Kenya and on the economy as a whole are alarming. The epidemic has severely hit the Kenyan workforce in its prime. Many of the victims are in their 20s and 30s, their most productive years, when they develop AIDS symptoms and begin to fall ill. The severe losses are affecting an entire generation. Beyond the human tragedy, the situation results in steadily rising costs to companies. The companies also suffer sharp decreases in profits, or losses, as a result of the loss of workers and decreased working hours caused by illness, death, overwork and stress, attendance at funerals and home care of ill dependents.

Country: Kenya.

Study area: Five commercial agro-estates in three provinces: Nyanza, Rift Valley and Eastern provinces.

Methodological approach: Review of medical expenses incurred by the estates and survey of households with AIDS patients.

Sample: Five commercial agro-estates.

Control group: No.

Outcomes studied: Absenteeism, labour time lost, medical expenses, funeral expenses.

Key results: Increase of absenteeism, increase in medical costs incurred by the agro-estates as well as in those incurred by individual households.

Shapouri, S., and S. Rosen (2001). Toll on agriculture from HIV/AIDS in sub-Saharan Africa

Summary: The study projects the production of crops in the most affected countries in sub-Saharan Africa and shows a slow growth in agriculture productivity and the overall economy, resulting in growing food insecurity over the last two decades. Even in countries like Uganda where, owing to the decline of HIV prevalence, food supplies are projected to be nutritionally adequate, food insecurity remains a major concern as a result of low incomes and a skewed income distribution. The projections assume that, by reducing the number of farm laborers, the AIDS epidemic could significantly diminish the region's food security. The projections also assume that the marginal productivity of labour remains constant over the projection period.

Countries: Kenya, Malawi, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: National rural population.

Methodological approach: Projections of grain market performance and nutritional vulnerability.

Sample: Not applicable.

Control or comparison group: Not applicable.

Sample size: Not stated.

Outcomes studied: Crop production.

Key results: Decrease in crop production and increase in crop imports.

Topouzis, D. (1998). The implications of HIV/AIDS for rural development policy and programming: focus on sub-Saharan Africa

Summary: The paper examines the implications of the HIV epidemic for rural development policies

and programmes in sub-Saharan Africa and, in particular, the interrelationships between rural development and HIV/AIDS and the broad policy and programming challenges that the epidemic poses for rural institutions. A conceptual framework for the identification of key policy and programming issues for rural development raised by HIV is proposed in the study. It is intended to provide guidance for the design and conduct of a set of four case studies to be carried out in Southern and Eastern Africa. The main objective of the case studies will be to help formal and informal rural institutions generate policy and programme responses to the HIV epidemic (in such areas as land tenure, agricultural research, training and extension, appropriate technology and credit) in each of the four countries.

Countries: Botswana, Kenya, Malawi, Uganda, United Republic of Tanzania, Zambia and Zimbabwe.

Study area: Rural areas of the selected countries.

Methodological approach: Development of a conceptual framework for the identification of the main policy and programming issues for rural development raised by the HIV epidemic.

Outcomes studied: Not applicable.

Key results: A conceptual framework for the identification of rural development policy and programme issues is proposed.

D. STUDIES ON EDUCATION

NOTE: Some of the studies reviewed in section X.A concern school enrolment.

Badcock-Walters, Peter, Christopher Desmond, Wendy Heard and Daniel Wilson (2003). Educator mortality in-service in KwaZulu Natal: a consolidated study of HIV/AIDS impact and trends

Summary: KwaZulu Natal has the largest provincial education system in South Africa, with 2.7 million learners and 75,000 educators in nearly 6,000 schools. With an antenatal HIV prevalence rate of about 35 per cent, it is also the province in South Africa most affected by HIV/AIDS. The present study reviewed all available data and attempted to establish a basis for estimating future demand for teachers. Data analysis confirmed that mortality among educators of both genders rose significantly from 1995 to 2001, especially among those aged 25 to 40. The overwhelming cause of death among both sexes under 45 was illness/natural causes.

Country: South Africa.

Study area: KwaZulu Natal province.

Methodological approach: Analysis of annual school survey data; a random sample survey of 100 schools to investigate reporting of educator mortality; analysis of educator mortality records, including pension and medical records.

Sample size: 100 schools, sampled randomly, in addition to provincial data on schools and pensions.

Control group: No.

Outcomes studied: Mortality rates of educators over a five-year period; cause of death of educators.

Key results: Mortality among educators of both genders rose significantly over the five years between 1997 and 2001, from 406 in 1997 to 681 in 2000 and 609 in 2001. A by-product of the 100-school random sample survey was an analysis of the quality and dependability of school record-keeping. Data were not available for many educators who took early retirement.

Bennel, P., and others (2002). The impact of the HIV/AIDS epidemic on the education sector in sub-Saharan Africa: a synthesis of the findings and recommendations of three country studies

Summary: The report presents the main findings and recommendations of an international research project, which has focused on assessing the impact of the HIV/AIDS epidemic on primary and secondary schooling in three countries: Botswana,

Malawi and Uganda. Adult HIV prevalence rates were estimated to be 36 per cent in Botswana, 21 per cent in Malawi and 8 per cent in Uganda in 1999. The report explores prevention for students and the impacts on students and teachers.

Countries: Botswana, Malawi and Uganda.

Sample size: A total of 41 schools in the three countries were surveyed.

Methodological approach: A range of qualitative and quantitative methods was employed. Extensive interviews of education managers and teachers were conducted. Representatives of ministries, non-governmental organizations and donor organizations were also interviewed.

Key results: The study found that in Botswana, absenteeism rates were relatively low and, in primary schools, that orphans had better attendance records than non-orphans. Strong school culture may explain the very low dropout rates in both primary and secondary schools. The Government has also introduced a comprehensive programme of material support for disadvantaged orphans. On the other hand, in Malawi and Uganda, absenteeism was very high among all primary school children. The principal causes were mainly poverty-related. While student absenteeism tended to be higher among orphans than non-orphans, the differences were much lower than expected. Illness in the family was not a major reason for absence, except for maternal and double orphans in Uganda. Generally the poorest orphans had the most problems at school.

Burkina Faso. National Committee to Combat HIV/AIDS and Sexually Transmitted Infections (2003). The impact of HIV/AIDS on the social sectors: the case of health care and education

Summary: HIV/AIDS has taken on such significant dimensions in Burkina Faso that it has had major economic and social repercussions. The study is a preliminary attempt to provide guidelines for the closer analyses and further assessments required to improve the general understanding of the impact of HIV/AIDS. It summarizes and evaluates the main impact studies and offers a conceptual framework for understanding the impacts, especially on the education and health sectors. It recommends areas for studies that would provide a better understanding of the impact of HIV/AIDS on households and the various social sectors.

Country: Burkina Faso.

Study area: Education and health sectors.

Methodological approach: Literature review. Analyses were carried out using data available from the health and education sectors and assuming different scenarios about HIV/AIDS prevalence rates. Results of qualitative studies were also considered.

Sample size: Not applicable.

Control group: Not applicable.

Outcomes studied: Impact of HIV/AIDS on demand for and cost of health care; impact on quality of health care; impact on children who lost parents to HIV/AIDS; impact on quantity and quality of educational services and on demand for education.

Key results: HIV/AIDS has already had major impacts on social sectors. In the health sector, 30 to 50 per cent of the hospital beds in Burkina Faso are monopolized by patients living with HIV/AIDS, and the increase in the demand for care was projected at 30 per cent by UNDP in 2000. The increase in resources allocated to HIV/AIDS treatment has resulted in fewer resources available to combat other scourges, such as malaria, malnutrition and tuberculosis. Fear of contracting the HIV virus on the part of health workers has led to a decline in the quality of care. In the education sector, the national goal of universal primary education has stagnated at about 30 per cent of eligible children. Girls constitute only about one third of the student population. Orphans are 50 per cent less likely to receive an education if a parent has died of AIDS and 90 per cent less likely if both parents died of the disease.

Goveia, Jeffrey Joseph (1999). Education and the epidemic: the effects of HIV/AIDS on basic education in Namibia

Summary: The report considers the effects that HIV/AIDS will have on the national education system in Namibia. It also considers the factors that have helped and continue to help the spread of the disease throughout Namibia and throughout Africa. It explores the effects AIDS will have on children and on student enrolments in the Namibian education system. It also considers the effects AIDS will have on the supply of and demand for teachers. Finally, it provides recommendations for addressing the AIDS crisis to leaders of all sectors of Namibian society, national and international aid organizations and education policymakers.

Country: Namibia.

Study area: National.

Methodological approach: Modelling was used to forecast the school-age population and the number of teachers. Data from 1992 to 1998 from the Ministry of Basic Education, Sport and Culture were also used. Projections with and without AIDS were carried out.

Key results: The national education system of Namibia is losing teachers, administrators and students at all levels as a result of AIDS. In 1998, 12,888 students were enrolled in grade 12 throughout Namibia. If Namibia has to produce nearly 2,000 teachers a year, almost one of every six secondary school graduates will need to complete teacher training college and enter the teaching corps to keep pace with the demand.

Kelly, M.J. (2000). The encounter between HIV/AIDS and education

Summary: In the paper the author has conceptualized HIV/AIDS as having the potential to affect education through ten different mechanisms: reduction in demand, reduction in supply, reduction in availability of resources, adjustments in response to the special needs of a rapidly increasing number of orphans, adaptation to new interactions both within schools and between schools and communities, curriculum modification, altered roles that have to be adopted by teachers and the education system, the ways in which schools and the education system are organized, the planning and management of the system, and donor support for education. Nevertheless, in the face of the epidemic, education can generate hope owing to its potential to work at different levels where AIDS-related interventions are needed.

Country: Zambia.

Study area: National.

Methodological approach: Estimation and projection of the school-age population, literature review.

Key results: The study found that HIV/AIDS is affecting pupils, teachers and the curriculum content in Zambia. It is also affecting the organization, management and planning of education and resources for education. It is slowly leading to questions about the very nature, purpose and provision of education. Many of the potential impacts that are outlined are already destroying the system. It is only when civil and public society come to grips with the potential and actual extent of those HIV/AIDS impacts that appropriate actions will be taken to respond to, and possibly even control, the situation.

A study conducted in two high-density areas in Lusaka found that of 1,359 children aged 18 and below, two thirds (67 per cent) had lost one or both parents. Seven per cent of them dropped out of school in the twelve months prior to the study as compared with an overall drop-out rate of 1.4 per cent in Lusaka the same year.

Malaney, P. (2000). The impact of HIV/AIDS on the education sector in Southern Africa

Summary: According to the author, the linkage between the education system and the AIDS epidemic can be seen as a dual one. On the one hand, the school system provides a mechanism for the transmission of information about HIV and hence can play a central role in the prevention effort. On the other hand, the disease undermines the structure and function of the education system itself.

The study focused primarily on the latter effect and developed a framework to assess the various aspects of the burden imposed by the disease.

The author lays out the framework to consider the range of effects that AIDS will have on the education sector. He then develops a model to assess the demand and supply effects of disease on the school system and to project necessary inputs in order to maintain educational quality. The study employs Namibia as a case study, using the model. Quantitative assessments of the extent of the impact on school systems are presented. That information is supplemented by qualitative data derived from focus groups conducted among schoolteachers and from in-depth interviews with principals.

Study area: Southern Africa.

Sample: Not applicable.

Methodological approach: Construction of input-output model, focus group discussions.

Key Results: According to the author, "Attendance is affected both directly and indirectly as a result of AIDS-related morbidity and mortality. Children orphaned by the disease will in many cases simply drop out, as they can no longer afford to attend school. In cases where caretaking responsibilities fall on students, absenteeism is likely to increase, and studies have shown that children who are excessively absent from school tend to perform poorly and drop out prematurely. Studies have also shown that the quality of education influences attendance". Using modelling with a lower enrolment for orphans (assumed at 76 per cent), the study projected that the total enrolment rate would decline to 86.7 per cent in 2005 and 85 per cent in 2010. In the study, the gross enrolment rate in Namibia was estimated at 87 per cent in 1999.

Schaeffer, S., (1994). The impact of HIV/AIDS on education: a review of the literature and experience

Summary: The study reviews the literature on HIV/AIDS and education. It states that the most immediate and visible impact of HIV/AIDS has already appeared in many education systems of the world. Children infected at birth have not lived to enrol in school; some of the children enrolled have dropped out of school in order to earn money for their families and care for ill relatives; and teachers have fallen ill and have died. In addition, as a result of the presence of HIV in the classroom and school, the process of teaching and learning itself has become more complicated and more difficult, and its quality has deteriorated. In some societies, this impact is barely noticeable, hidden by the normal process of change and subsumed by the more obvious and immediately visible problems of poverty, drought, war and other illnesses.

Countries: Not applicable.

Study area: national or regional: Not applicable.

Methodological approach: Literature review.

Key results: Fewer children will be born in societies where HIV/AIDS is present than in those where it is not present. Most children infected perinatally will develop AIDS and die before reaching school age, and many children may not enrol in school or may leave school owing to the direct and indirect effects of AIDS. The decrease is already evident in some areas such as the Rakai district of Uganda, with a drop in enrolment from 1,534 children in 1989 to 950 in 1993.

Studies also show that, in the United Republic of Tanzania, some 14,460 teachers will die by 2010 and 27,000 teachers by 2020. The study estimates that the approximate cost of training replacement teachers will be $37.8 million. In Uganda, between 1993 and 1996, it was estimated that 2,200 teachers were suffering or dying from AIDS, with a replacement cost of 1.1 billion Uganda shillings or $1 million.

The net result of the various kinds of impacts on the demand, supply and process of education may be a loss of both financial and human resources (and thus the quantity of education) and of efficiency and effectiveness (and thus the quality of education).

Izazola, J-A., J. Saavedra, J. Prottas and D. Sheppard (1998). Expenditures on the treatment and prevention of HIV/AIDS in Mexico

Summary: The study presents estimates of the total public and private spending on AIDS prevention and treatment in Mexico and compares the level of subsidy for AIDS treatment with subsidies for curative care in general. It provides background on the AIDS epidemic in Mexico and the health care system, reviews the methodology used to estimate costs and presents the expenditure estimates. It concludes with a discussion of the determinants of those spending patterns.

Country: Mexico.

Study area: National coverage.

Methodological approach: Estimates of AIDS prevention and treatment expenditures were made by using official government budgets and by interviewing physicians, representatives of non-governmental organizations and top officials in social security institutions and major public hospitals. A household survey (ENSA II) was used to estimate private, out-of-pocket expenditures. Most of the documents used for the study contained 1994 expenditures, the latest available data at the time of the analysis (May 1996). The expenditures were then corrected based on 1995 planned spending increases and converted to United States dollars for comparability.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: The results show that Mexico spent $79.1 million on AIDS-related health care and prevention in 1995, or about 1 per cent of its total (private and public) health expenditures. For an estimated 15,800 people with AIDS, that expenditure seems a very heavy burden, according to the authors. About 63 per cent of total AIDS costs went directly to treatment.

Koné, T., A. Silué, J. Agness-Soumahoro, R. Bail and D. Shepard (1998). Expenditures on AIDS in Côte d'Ivoire

Summary: The study analyses the expenditures on AIDS in Côte d'Ivoire in relation to total health care expenditures; the source of funding for treatment, prevention and activities to mitigate the impact of AIDS; and the determinants of those funding patterns. In particular, it shows how government policies result in explicit and implicit subsidies that support hospital care.

Country: Côte d'Ivoire.

Study area: National coverage.

Methodological approach: As insufficient systematic data on costs and expenditures were available, a workshop was organized in May 1996 in Abidjan with AIDS experts, including physicians, leaders of non-governmental organizations, epidemiologists, health economists, a traditional practitioner, and representatives of the National AIDS Control Programme (NACP). Using a structured survey, workshop participants estimated the costs of treatment for various types of patients. In order to improve and adjust the preliminary estimates, additional data were collected from government documents, international institutions, research studies, prescribing guides and non-governmental organizations.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures broken down by public, private and donors.

Key results: AIDS expenditures represented 8.5 per cent of total health spending in 1995. Most AIDS expenditures were financed by private sources (50.3 per cent) as compared with Government (42.0 per cent) and donors (7.7 per cent). Treatment expenditures (92.5 per cent of total expenditures on AIDS) were far in excess of prevention (7.2 per cent) or mitigation (0.3 per cent) expenditures.

Kongsin, S., C.S.M. Cameron, L. Suebsaeng and D. Shepard (1998). Levels and determinants of expenditure on HIV/AIDS in Thailand

Summary: The study examines the level of health expenditures in Thailand. The Thailand National AIDS Control Programme (NACP) has evolved in complex and interrelated ways in response to the changing epidemic and lessons learned about prevention and control. The report focuses on the costs of AIDS prevention and treatment. The authors present an analysis of the NACP budget by programme and by ministry; estimate the costs of caring for persons with AIDS; analyse the combined national costs of AIDS prevention and control by source of funding; and compare AIDS expenditures with expenditures on other health programmes.

Country: Thailand.

Study area: National coverage.

Methodological approach: Household survey, financial reports of public expenditures or budgets and country workshops to estimate treatment costs by type of patient.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: In 1994, $95.5 million was spent on AIDS prevention and treatment by public and private sources. Of that amount, 88 per cent was provided domestically, and the remaining 12 per cent came from official development assistance (ODA), including bilateral aid. As the Government of Thailand provides the vast majority of resources, the Government has significant power to direct how those funds are invested. This situation differs from that observed in many other countries where official development assistance dominates funding of HIV/AIDS-related activities.

Shepard, D.S. (1998). Levels and determinants of expenditures on HIV/AIDS in five developing countries: overview

Summary: The study is based on case studies from five developing countries with moderate to severe AIDS epidemics and a range of economic conditions: Brazil, Côte d'Ivoire, Mexico, Thailand and the United Republic of Tanzania. A common methodology was used across all five case studies. This study found that, with the exception of Mexico, public funding per capita for HIV/AIDS rises with higher gross national product per capita. Brazil, with the highest GNP, also has the highest AIDS expenditures per capita. The prevalence of HIV also affects AIDS expenditures. The United Republic of Tanzania, with the highest prevalence among the countries under study, has moderately high expenditures despite having the lowest GNP per capita.

Countries: Brazil (Sao Paulo only), Côte d'Ivoire, Mexico, Thailand and United Republic of Tanzania.

Study area: National coverage.

Methodological approach: For each country, the study relied on a combination of objective and subjective information. The study used five sources of data on expenditures:

- Financial reports of public expenditures or budgets
- Country workshops to estimate treatment costs by type of patient
- Special health-sector analyses (United Republic of Tanzania only)
- A detailed database of public hospital claims (Brazil only)
- Household surveys (Thailand only)

Detailed estimates of expenditures were obtained according to the use of funds (prevention, treatment and mitigation of the impact of AIDS) and by the source of finance. Where objective in-

formation was missing, incomplete, inconsistent, out of date or of questionable accuracy, informed experts were consulted. Except for countries where public sector health expenditure data were available from special studies, public budgets were used to estimate public expenditures.

Total health expenditures and the breakdown among public, private and donor financing were based on Murray, Govindaraj and Musgrove (1994), using data for 1990. Overall health expenditures were extrapolated to the target year by assuming the same ratio of health expenditure to GDP and the same distribution of expenditure among funders (public, private and donors) as in 1990. The specific sources of data are described in each case study.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: Health expenditures.

Key results: The study found an increase in the HIV/AIDS-related health expenditures in each of the countries studied.

Tibandebage, P., S. Wangwe, P. Mujinja, R. Bail and D. Shepard (1998). Expenditures on HIV/AIDS in Tanzania

Summary: The study examines expenditures on AIDS, their breakdown by source of financing and by intervention, and their major determinants. Both quantitative data from research studies and government documents and secondary qualitative information are used. In addition, the study benefited from information obtained from the proceedings of a workshop attended by experts in clinical, epidemiological, social and economic aspects of HIV/AIDS, and from interviews with officials in the Government and with representatives of non-governmental organizations whose activities include treatment, prevention and/or mitigation of the impact of AIDS.

Country: United Republic of Tanzania.

Study area: National coverage.

Methodological approach: The study relied on a combination of objective and subjective information: financial reports of public expenditures or budgets, country workshops to estimate treatment costs by type of patient and special health-sector analyses.

Control group: Not applicable.

Sample size: Not applicable.

Outcomes studied: AIDS health expenditures.

Key results: Most financial resources in the Tanzanian health sector were allocated to treatment: 59.5 per cent of total health care expenditures went for treatment, whereas prevention interventions received 39.6 per cent of total health expenditures. In contrast, most financial resources for HIV/AIDS and STDs were allocated to prevention (84.1 per cent).

F. STUDIES ON ECONOMIC GROWTH

Arndt, C., and J.D. Lewis (2000). The macro implications of HIV/AIDS in South Africa: a preliminary assessment

Summary: The authors reported the preliminary results from an analysis of the macro implications of HIV/AIDS in South Africa. They constructed an economy-wide simulation model that embodied the important structural features of the South African economy, into which they added major impact channels of the HIV/AIDS epidemic. Using demographic estimates for the impact of the epidemic (on labour supply, death rates and HIV prevalence), along with assumptions about the behavioural and policy responses (household and government spending on health, slower productivity growth), the authors generated two scenarios: no-AIDS and AIDS scenarios. The results showed that over the period 1997-2010, GDP growth rates for the two scenarios would diverge steadily, reaching a maximum difference of 2.6 percentage points by the end of the projection period of 2010.

Country: South Africa.

Methodological approach: Simulation model with two scenarios: hypothetical no-AIDS and the AIDS scenario.

Outcome studied: GDP growth rate and level.

Key results: Gross domestic product level in 2010 is 17 per cent lower in the AIDS scenario than in the no-AIDS scenario. The growth rate of GDP is 2.6 percentage points lower in 2010 than it would have been in the absence of AIDS.

Barnett, T., and A. Whiteside (2000). Guidelines for preparation and execution of studies of the social and economic impact of HIV/AIDS

*Summar*y: The authors propose guidelines for the study of the social and economic impact of HIV/AIDS. The guidelines are intended for policy makers and researchers for those countries with serious HIV/AIDS epidemics. The goal is to place socio-economic impact studies in the planning process of a country in a systematic way. Countries are increasingly adopting strategic approaches to planning and implementation.

Bloom, D.E., D. Canning and J. Sevilla (2001). The effect of health on economic growth: theory and evidence

Summary: Macroeconomists acknowledge the contribution of human capital to economic growth, but their empirical studies have defined human capital solely in terms of schooling. In the paper the authors extended production function models of economic growth to account for two additional variables that microeconomists have identified as fundamental components of human capital: work experience and health. The main result of the study was that good health has a positive, sizeable, and statistically significant effect on aggregate output. Average work experience varied little across countries; therefore, differentials in work experience accounted for little variation in rates of economic growth. The authors also found that the effects of average schooling on national output were consistent with microeconomic estimates of the effects of individual schooling on earnings, suggesting that education creates no discernible externalities.

Countries: National-level data for 104 countries.

Methodological approach: Regression modelling of growth rate of GDP. In the regression, the inputs were physical capital, labour and human capital. Panel data for 1960-1990 were used.

Outcomes studied: Output or gross domestic product.

Key results: The main result of the study was that good health (lower mortality) had a positive, sizeable and statistically significant effect on aggregate output. There was little variation across countries in average work experience; therefore, differentials in work experience accounted for little variation in rates of economic growth.

Botswana Institute for Development Policy Analysis (2000). The macroeconomic impact of HIV/AIDS in Botswana

Summary: The objective was to estimate the impact of HIV/AIDS on macroeconomic indicators, including GDP and unemployment. Under the scenario considered most likely, HIV/AIDS reduced the growth rate of GDP by 1.5 percentage points, so that after 25 years the economy would be 31 per cent smaller than it would otherwise have been. Per capita GDP was, however, virtually unaffected by HIV/AIDS owing to the projected population impact. The model predicted that unemployment among unskilled workers would be lower as a result of HIV/AIDS, and the existing shortage of skilled workers would be exacerbated, causing a 12-17 per cent rise in skilled wages. The model also predicted an 18 per cent rise in the capital-output ratio. The Botswana economy is significantly more capital intensive than most African countries, which offers a shield against the labour impacts of HIV/AIDS. In addition, diamond revenues will continue to ensure that investment is not constrained by savings in the medium term. HIV/AIDS will, however, worsen existing skilled labour shortages and will put pressure on already overburdened systems to import expatriate skills. In the medium term, a shortage of skilled labour may also have a signifi-

cant negative impact on investor confidence. The predictions of the model are sensitive to small changes in investment growth. The results suggest that the key area for government intervention is in skilled labour supply, investment and productivity. Policy efforts should be devoted to maintaining investment, especially in the private sector.

Methodological approach: A two-sector, three-factor equilibrium model for the Botswana economy was constructed to project the growth path of the economy over a 25-year period, from 1996 to 2021, under "with-AIDS" and "no-AIDS" scenarios. The model distinguished between skilled and unskilled labour and between the formal and informal sectors. The impacts of HIV/AIDS operated through the supply of labour and through investment growth.

Output studied: GDP growth, unemployment, wages and capital-output ratio.

Keys results: AIDS is projected to reduce the annual growth rate of GDP by 1.5 percentage points over the 25-year period but to have no effect on the growth rate of GDP per capita. AIDS will worsen the shortage of skilled workers.

Over, M. (1992). The macroeconomic impact of AIDS in sub-Saharan Africa

Summary: The paper was one of the first studies to provide detailed calculations of the probable magnitude of the impact of HIV/AIDS. Growth trajectories of 30 sub-Saharan African countries were projected for the period 1990-2025 under "with-AIDS" and "no-AIDS" scenarios. One purpose was to explore how the economic effects of the epidemic depended on alternative assumptions about its distribution and the financing of its costs. The study found that an AIDS epidemic could reduce the growth rate of per capita income in the average country even when it was evenly distributed across productivity classes of workers, provided that at least half of the treatment costs were extracted from savings. For the assumptions regarded as most plausible—that each education class had double the risk of the one beneath it, and that half of the treatment costs were financed from savings—the net effect of the AIDS epidemic was to reduce the annual growth rate of per capita GDP by about one third percentage point in the 10 countries with the most advanced epidemics.

Methodological approach: A two-sector (rural-urban) partial equilibrium neoclassical economic growth model was constructed, distinguishing three classes of workers (defined by level of education).

Outcomes studied: Growth of per capita GDP.

Key results: During the period 1990-2024, annual growth rate of per capita GDP reduced by about one-third percentage point in the 10 countries with the most advanced epidemics.

Quattek, K., and T. Fourie (2000). Economic impact of AIDS in South Africa: a dark cloud on the horizon

Summary: The study uses the Wharton Econometric Forecasting Associates' time series-based macroeconomic model to derive the impact of HIV/AIDS on the economy of South Africa for the period 2000-2015. The model shows that AIDS will reduce the annual growth rate of GDP by 0.2-0.3 percentage point up to 2005 and thereafter by 0.3-0.4 percentage point. Since AIDS is expected to reduce population growth by a larger proportion, per capita income is projected to be higher, as compared with a no-AIDS scenario.

Methodological approach: Macroeconomic model widely used in commercial forecasting.

Outcomes studied: Gross domestic product, domestic savings, household disposable income, unemployment, trade.

Key results: AIDS is expected to reduce the annual growth rate of GDP by 0.3-0.4 percentage points by 2011-2015. GDP per capita is projected to be higher in the AIDS scenario than in the no-AIDS scenario.

Rühl, C., V. Pokrovsky and V. Vinogradov (2002). The economic consequences of HIV in Russia

Summary: The study examined the impact of AIDS on the economy of the Russian Federation. The HIV prevalence rate was still low, but the authors predicted that the impact of the disease on the Russian economy would be worse owing to the population decline. By 2010, they projected that GDP would be 4.5 per cent lower, and without intervention the loss would rise to 10.5 per cent. The study also projected that investment would decline more than production, around 14.5 per cent in 2020. Negative population growth would impede investment and economic growth by rerouting resource flows towards consumption. HIV/AIDS exaggerated the effect.

Country: Russian Federation.

Methodological approach: The computer model utilized in the study distinguishes between three HIV transmission groups: transmission among drug users; from drug users to non-drug users; and among non-drug users. A total of 26 input parameters were included in the model. The results of model calibration indicated that the set of four parameters to which the economic consequences of HIV reacted the most were the rate of population growth, the rate of growth of drug users, the HIV transmission rates and the multiplier.

Outcomes studied: Gross domestic product.

Key results: By 2010, the authors projected that GDP would be 4.5 per cent lower and that without intervention the loss would rise to 10.5 per cent. The study also projected that investment would decline more than production, by around 14.5 per cent in 2020.

Theodore, Karl (2001). HIV-AIDS in the Caribbean: economic issues—impact and investment response

Summary: The paper estimates the impact of HIV/AIDS on the economies of the Caribbean. The author uses the output of a 1997 study on the impact of HIV/AIDS in Jamaica and Trinidad and Tobago as the starting point and updates the projections of those two countries based on adjustments to some of the underlying assumptions with respect to the epidemiology of the disease. The study identifies four channels through which the HIV/AIDS epidemic can affect the development process and makes the case that HIV/AIDS has the potential to distort that process. Two scenarios are considered based on the medical coverage of AIDS patients.

Countries: Jamaica, Trinidad and Tobago and St. Lucia.

Methodological approach: The analysis employs an econometric model distinguishing agricultural, manufacturing and services sectors, fitted to the economies of the three countries. The model comprises five blocks: labour supply and wages, employment, saving and investment, cost of HIV and output.

Outcomes studied: Gross domestic product.

Key results: Declines of the gross domestic product by 2005 of 4.9 per cent in Jamaica, 2.1 per cent in St. Lucia and 5.6 per cent in Trinidad and Tobago were estimated in the first scenario in which 100 per cent of patients were medically covered. In the second scenario, in which only 20 per cent were covered, the declines were 3.2 per cent, 1.6 per cent and 4.9 per cent respectively.

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