

Infertility research and technology advances.

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Outline

Burden of infertility

Few highlights in research and technology advances

Need to mitigate risks of technological advances

Conclusion

Global estimates of infertility prevalence

Global infertility prevalence estimates

global infertility prevalence estimates are:

Approximately **one in six** people have experienced infertility at some stage in their lives, globally.



17.5%

Estimated lifetime prevalence of infertility
(95% confidence interval: 15.0, 20.3).

Lifetime prevalence is defined as the proportion of a population who have ever experienced infertility in their life.



12.6%

Estimated period prevalence of infertility
(95% confidence interval: 10.7, 14.6).

Period prevalence is defined as the proportion of a population with infertility at a given point or interval in time, which may be current or in the past.

Prevalence by country income classification

- No significant difference between high income and low- and middle-income countries
- Indicates the perverse nature of infertility.

Lifetime infertility prevalence

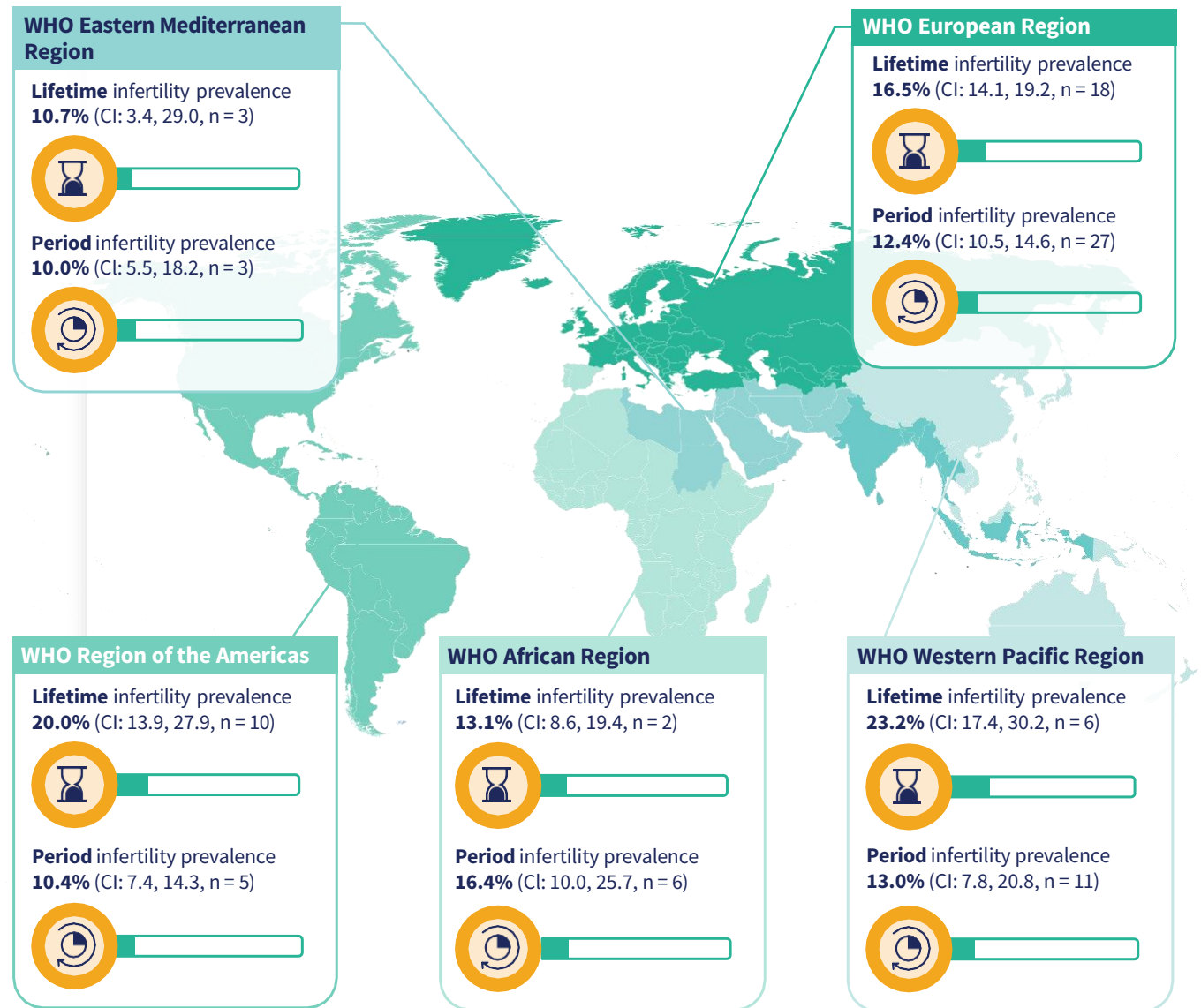


Period infertility prevalence



Regional estimates

- While there was a trend towards higher prevalence of lifetime infertility in Western Pacific Region and of period infertility in the African Region, these regional differences were not conclusive given overlapping confidence intervals, limited data.



CI = Confidence interval
n = number of studies

WHO = World Health Organization
No studies were available for the WHO South-East Asia Region



Relevance of addressing Infertility Research and Technological advances

Relevant to ICPD

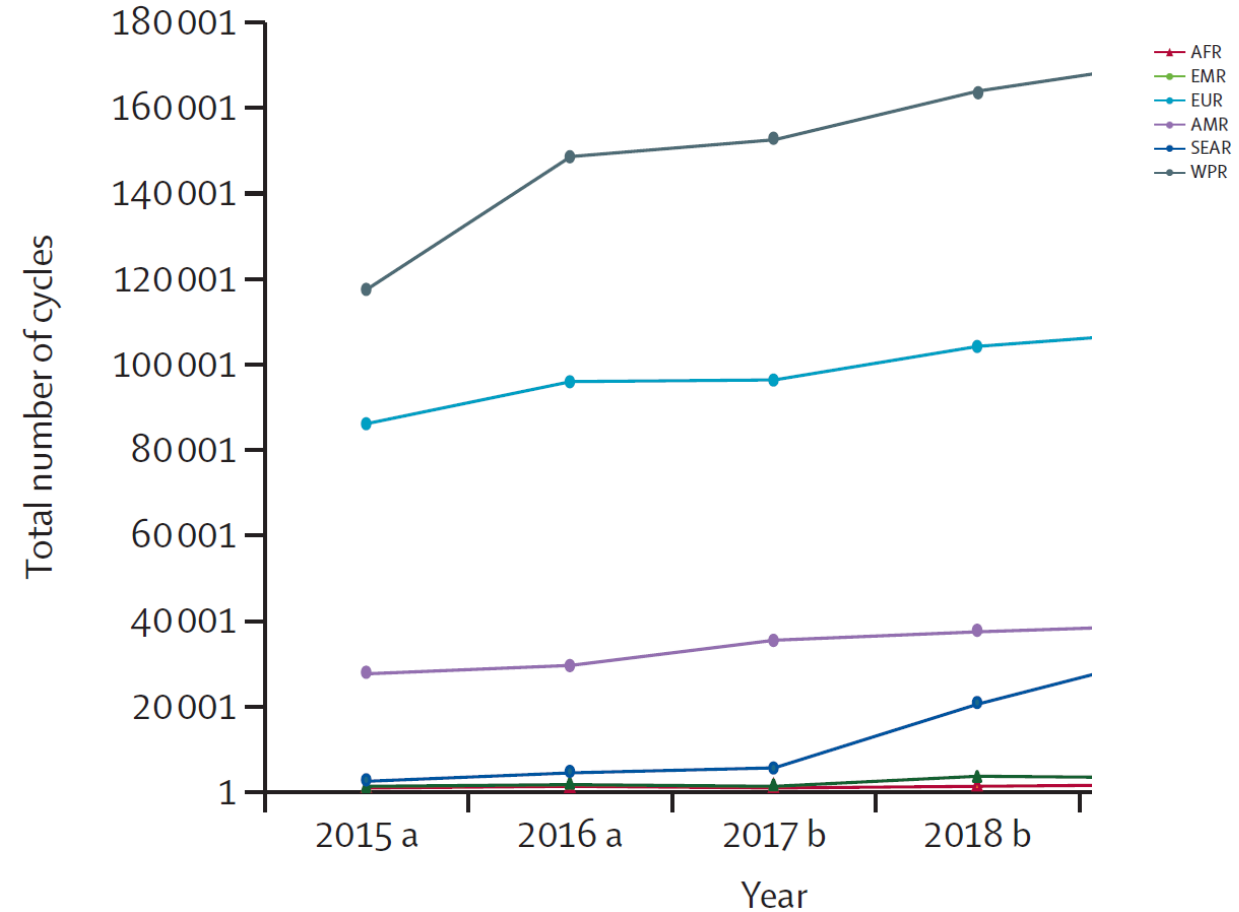
Relevant to the right to enjoy the benefits of scientific progress and its applications

Technology and research are can aid realization of fertility preferences and the right to health

Key highlights in Infertility Research and Technological Advances

Key highlights: Medically assisted reproduction

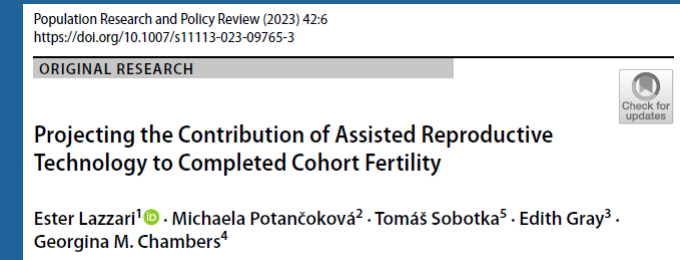
- Assisted Reproductive Technologies:
 - IVF and ICSI
- ART has risen exponentially: 10 million babies born via ART
- Research on adjuvant treatment modalities > ART effectiveness.
- Recent advances in surgical methods including uterine transplantation, cryopreservation/vitrification and other aspects of fertility preservation
- Advances in mitochondrial donation treatment (MDT)/ mitochondrial replacement therapy



Key highlights:

Medically assisted reproduction and TFR

- Increasing research related to the contribution of ART to Total Fertility rates (TFR).
- Several studies looking at completed cohort fertility, advanced maternal age, and contribution of ART to first births.
- Infertility is not the same as decline in total fertility rate, but some covariates, such as advanced maternal age, contributes to both.
- Safeguarding reproductive rights as countries adapt to declines in TFR is essential.



Key highlights: Artificial intelligence

- Application of AI increasing in infertility (service delivery level)
- Among leading SRH areas where AI is applied based on recent WHO global scoping review.
- AI being applied to aid clinical decisions, e.g.
 - Use of AI algorithms to predict prognosis and potential outcomes in treatment
 - Use of AI to select embryos or sperms
- Telescopic surgery can enable treatment in places with unskilled workers: in early stages



Key highlights: Artificial intelligence and personalized fertility care

Individual levels:

- Use of AI in nonprescribed digital wearables to track the fertile / prediction of ovulation digital apps.
- Data protection often unclear.

Health system level

- Confluence of AI and robotic systems (early stages) eg IVF laboratories, surgeries to improve precision.



Key highlights:

Genomic and radiomic diagnosis

- Increasing exploration of biomarker identification and genetic profiling
- Potential for radiomics increasing, i.e., the extraction of multiple features from radiographic medical images using data-characterization algorithms to aid in diagnosis. Often aided by AI.
- Despite these advances, clinical guidelines rare in many countries

Coming soon

Guideline for the
prevention, diagnosis
and treatment
of infertility

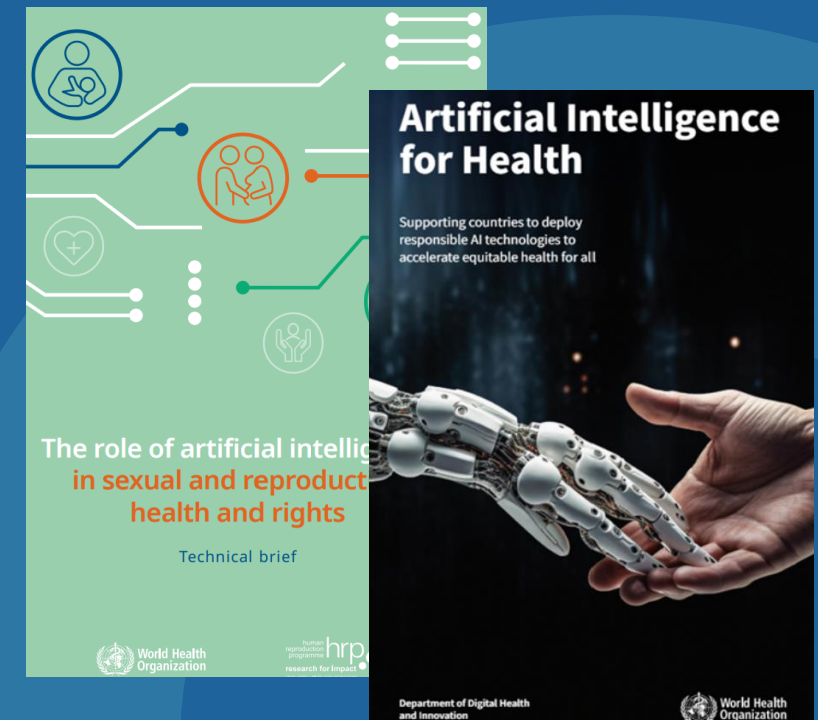
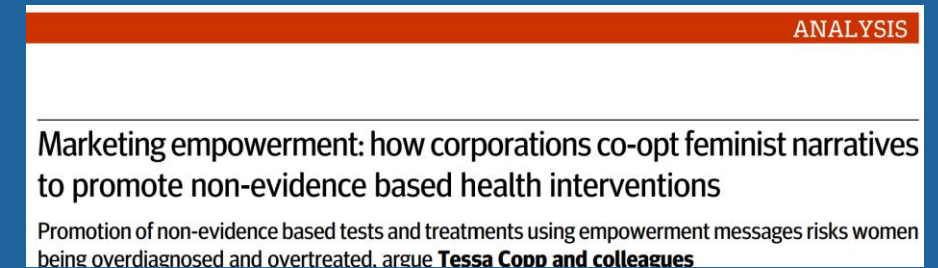
Need to mitigate potential risks and inequalities of technological advances

- Some technological advances can reinforce inequalities or lack validation in large studies.
- Global access to ART is inequitable, being high in high income settings, and remaining low in the African region and the eastern mediterranean region. Western Pacific region now accounts for nearly half of global cycles.
- Cost of IVF still high in some countries people incur out of pocket costs of up to 200% of their annual income on a single cycle of IVF.
- Mitigation of inequality and ethical issues are needed even as we advance technologically.



Need to mitigate potential risks and inequalities of technological advances

- Commercialization of some technologies can lead to misdiagnosis, misinformation.
- AI advancements need contribute to fertility care in a way that is safe, ethical and equitable, with appropriate governance and regulation. Advances in AI are outpacing regulations
- Aim: provide guidance on governance, ethical standards and regulations to address emerging opportunities and challenges, mitigate risks, safeguard public health, and foster trust in the use of AI for health



Conclusions

- Increasing infertility research and technological advances
- Research and technological advances can assist people to achieve their fertility preferences
- Need to strengthen governance and guidance to optimize benefits of research and technological advances while safeguarding reproductive rights and other concerns



Thank you.

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