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Regulatory safeguards needed if preimplantation genetic testing for polygenic risk scores (PGT-P) is permitted in Singapore

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Abstract Singapore, a highly affluent island city-state located in Southeast Asia, has increasingly leveraged new assisted reproductive to overcome its dismal fertility rates in recent years. A is preimplantation genetic testing (PGT) for polygenic risk scores (PRS) to predict complex multifactorial traits in IVF (in vitro fertilisation) embryos, such as type 2 diabetes, cardiovascular diseases and various other characteristics like height, intelligence quotient (IQ), hair and eye colour. Unlike well-known safety risks with human genome editing, there are negligible risks with PGT-P, because there are no man-made genetic modifications that can be transmitted to future generations. Nevertheless, the current efficacy of using PGT-P to select IVF embryos for either increased or decreased probability of developing specific polygenic traits is still far from certain. Hence, the regulatory safeguards proposed here will be based on the assumption that the efficacy of this new technology platform has already been validated. These include: (1) restricting the application of PGT-P only for prevention of clinically relevant polygenic disease traits, (2) securely blocking patients' access to

the raw genomic DNA sequencing data of their IVF embryos, (3) validating diagnosis of polygenic disease traits in the prospective parents/grandparents of IVF embryos, and restricting PGT-P only for preventing specifically diagnosed polygenic disease traits and (4) mandating rigorous and comprehensive genetic counselling for IVF patients considering PGT-P. There is an urgent and dire need to prevent abuse of the PGT-P technique, as well as protect the interests and welfare of patients if its clinical application is to be permitted in the country.

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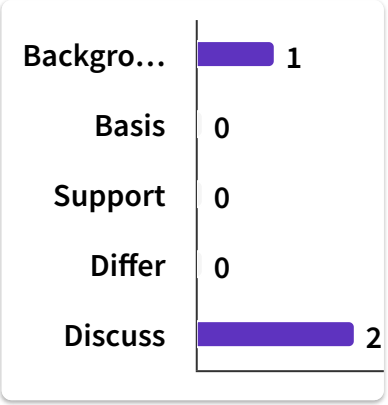

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