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high-risk populations of men who have sex with men (MSM).[1] Periodic STI testing among MSM is, therefore, crucial to prevent ongoing transmission. However, financial constraints remain an important barrier to STI testing in certain populations. In *The Lancet Infectious Diseases*, Katherine Li and colleagues[2] provide innovative evidence of the use of a form of crowdsourcing to improve STI testing uptake in Guangzhou, China, where there are low rates of STI testing among the MSM population and the linkage between STI and HIV services is low. The authors demonstrated that the pay-it-forward programme, consisting of giving free STI testing to MSM and giving them the option to finance a test for future participants, can supplement and increase STI testing uptake.

Crowdsourcing is based on the principles of open and user innovation, the wisdom of crowds, and collective intelligence in problem solving.[3] Open and user innovation approaches allow organisations to better develop novel products or services by bringing in outsiders. Here, Li and colleagues used an open challenge contest through multisectoral partnership to develop the name and the style of the programme materials. The wisdom of crowds principle engages the community to solve a problem collectively instead of individually. Collective intelligence is the scale-up capacity of large groups and the network structure to help foster large-scale interaction.[3] In this study, community volunteers helped organise the programme and each participant wrote a message on a postcard for participants who would benefit from this donation in the future. These motivational messages further potentiated donations.

By applying these concepts in a pay-it-forward model, MSM received free chlamydia and gonorrhoea testing and voluntarily were asked if they were willing to voluntarily donate funding for STI testing for a future participant. In this setting, which included predominantly first-time test recipients for chlamydia and gonorrhoea, 54% of MSM in the pay-it-forward group (109 of 203 men) received chlamydia and gonorrhoea testing compared with 6% of MSM in the standard-of-care group (12 of 205 men). What is also remarkable is that 97 (89%) of 109 men who received a pay-it-forward free test also donated funds for STI testing of future participants, which overall accounted for 80% of the cost of testing. This study provides evidence that improved and more efficient ways of community mobilisation, engagement, and utilisation of MSM-friendly trusted clinics have the potential to hugely enhance STI testing interventions. It will be interesting to explore if applying a pay-it-forward intervention strategy to a new group of MSM not previously engaged and connected to community-based organisations would provide similar benefits of increased STI testing uptake. Furthermore, although a few new infections were uncovered, the use of urine swabs might have underestimated these infections and therefore future research should consider the collection of rectal swabs to improve STI diagnoses.

Although we expect to see more use of crowdsourcing as an intervention in public health, it is important to recognise that crowdsourcing is most effective as a supplement to traditional intervention, not a substitute, as evident in the work by Li and colleagues. As such, it should be rapidly explored in addition to our arsenal in the fight against HIV and STIs.

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1 Global healh sector strategy on sexually transmitted infections 2016–2021: towards eding STIs. Geneva: World Health Organization, 2016.
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Group B streptococcal disease: unmet needs in high-income countries

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The bacteria group B streptococcus, estimated to cause more than 319 000 infant infections, 90 000 infant deaths, and 57 000 stillbirths annually worldwide,[1] emerged as a leading pathogen of newborn babies in the 1960s. Disease in the first week of life (early onset) can be prevented through targeted administration of

intrapartum antibiotic prophylaxis. In most low-income countries and many middle-income countries, this strategy is not feasible. By contrast, a majority of high-income countries have implemented intrapartum antibiotic prophylaxis policies.[2] Subsequent declines in the burden of early-onset disease have led some stakeholders to consider the prevention mission as accomplished for settings implementing these policies. Currently, there is no prevention strategy for group B streptococcal disease from day 7 to day 89 of life (late onset). In *The Lancet Infectious Diseases*, Catherine O'Sullivan and colleagues[3] remind us that prevention of infant group B streptococcal disease is still an unmet medical need in high-income countries. Adjuncts or alternatives to intrapartum antibiotic prophylaxis such as maternal immunisation will be needed for sustained reductions in the infant disease burden.[1]

The UK and Ireland target women for intrapartum antibiotic prophylaxis on the basis of presentation with specific clinical risk factors; an initial set of risk factors including previous infant with group B streptococcal disease, group B streptococcus in the urine during pregnancy, prolonged membrane rupture, and maternal fever, recommended by the Royal College of Obstetricians and Gynaecologists (RCOG) in 2003, was expanded in 2012 to include preterm premature rupture of membranes[4] and in 2017 to include threatened preterm delivery.[5] Although such risk-based approaches have been associated with substantial declines in early-onset disease in some settings (eg, Queensland, Australia[6]), the results presented by O'Sullivan and colleagues suggest an increased incidence of both early-onset and late-onset group B streptococcal disease in the UK and Ireland in 2014–15 compared with 2000–01. The estimate for infants aged younger than 3 months of 0·94 per 1000 livebirths in 2014–15 is twice as high as that for developed countries in a recent meta-analysis.[7]

The design of the study by O'Sullivan and colleagues is not optimal for analysis of trends over time because continuous active surveillance was not done and case ascertainment methods might not have been identical between the two 13-month periods compared. Interestingly, however, the Netherlands, which also implements a risk-based approach, reported a similar increase in both early-onset and late-onset disease, in that instance associated with the emergence of clone ST17.[8] Although ST17 represented 43% of available UK isolates from 2014–15, isolates from the earlier 2000–01 period were not available for comparison.

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It is possible that the inclusion of threatened preterm delivery in RCOG's 2017 guidelines[5] will lead to reductions in the disease burden of group B streptococcus in infants. It is also possible that further prevention of early-onset disease could be accomplished through a transition to universal antenatal screening for group B streptococcus colonisation. A large observational study documented that universal microbiological screening, the predominant strategy in high-income countries,[2] is greater than 50% more effective than the risk-based approach.[9] The RCOG 2017 guidelines call for a cluster-randomised trial comparing screening and the risk-based approach before consideration of such a transition.[5]

Strong implementation of either a risk-based or screening-based strategy typically results in a substantial portion of births exposed to intrapartum antibiotic prophylaxis. Although the effectiveness of this intervention in preventing infant group B streptococcal disease is clear, theoretical concerns about potential lasting consequences of disruption of the newborn microbiome at the time of birth continue to accumulate.[10] Evidence to shed light on these concerns is sorely needed.

Under any intrapartum antibiotic prophylaxis strategy, a portion of early-onset disease and the full late-onset disease burden remains. In the USA in 2015, despite a greater than 80% decline in incidence of early-onset disease following the introduction of intrapartum antibiotic prophylaxis, 2120 cases of group B streptococcus in infants younger than 3 months of age occurred nationally, 840 of which were early onset.[11] This is similar to the number of pertussis cases in infants younger than 3 months of age in the USA in 2012 (n=2270),[12] a peak pertussis year that motivated recommendations for maternal Tdap (tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis) immunisation. In the case of Tdap, a licensed vaccine was already available and in use for adults, facilitating the expansion to pregnant women.

WHO has recently prioritised maternal group B streptococcus vaccine development.[13] Capsular polysaccharide-protein conjugate and common protein vaccine formulations are undergoing phase 1 and phase 2 trials. WHO has said that the most sustainable pathway for a maternal group B streptococcus vaccine

will be concurrent development for high-income, and low-income and middle-income countries.[13] The need for maternal group B streptococcus vaccine in low-income and middle-income countries that do not have the infrastructure and resources to implement intrapartum antibiotic prophylaxis strategies is clear.[1,14] The data presented by O'Sullivan and colleagues underscore that high-income countries also have a shared interest in alternatives or adjuncts to intrapartum antibiotic prophylaxis to protect infants from group B streptococcus.

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Primaquine for all: is it time to simplify malaria treatment in co-endemic areas?

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In most areas endemic for malaria, the major species are *Plasmodium falciparum* and *Plasmodium vivax*. Falciparum malaria is more often lethal, develops resistance to drugs easily, and is responsible for most of the malaria burden in Africa. However, particularly in this second era of malaria elimination efforts,[1] *P vivax* requires increasing attention[2] because of the intrinsic challenges related to its control. This species can lead to severe or even life-threatening disease,[3] can present variable evidence of resistance to chloroquine in relation to geographical area,[4] and has few drug options to prevent relapse. Prevention of relapse is essential because up to 80% of reported cases of *P vivax* malaria could result from hypnozoite-derived relapses, rather than from newly acquired infections.[5] The triggers of relapse are not sufficiently understood, but 8-aminoquinolines (such as primaquine, or the newly registered tafenoquine) are the only effective drugs enabling radical cure.

There are several sources of variation in relapse rates. Different strains of vivax have distinct relapse patterns,[6] and pharmacogenetics also seems to have a role in primaquine metabolism, which could affect relapse as primaquine only becomes active once metabolised (CYP 2D6 pathway) into its active metabolites.[7] However, acute infections may also trigger relapses.[8] Data showing possible *P vivax* relapses after *P falciparum* infection were obtained first in Thailand,[9] but an analysis reported in *The Lancet Infectious Diseases* by Robert Commons and colleagues[10] provides statistical robustness regarding this observation. Their impressive meta-analysis, which included 31 262 patients from 153 studies done over more than four decades, supports that such relapses are not just local, but rather occur