done (also known as a stepped-wedge design[12]). Although this process might make scientific and economic sense, it would require joint research and health sector funding to be feasible. Perhaps referral is sufficient.

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Community management of severe pneumonia in children

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Pneumonia is the most common cause of death and hospital admission in children younger than 5 years.[1] 151 million of 156 million cases every year arise in the developing world and 1·6 million children will die.[2] UNICEF has called pneumonia "the forgotten killer of children".[3] Most cases of pneumonia occur where diagnostic facilities and health staff are in short supply. For these reasons WHO made the pragmatic decision to define pneumonia according to a few clinical signs and symptoms—namely cough, rapid breathing, and lower chest indrawing, with or without the danger signs. On the basis of these findings, a diagnosis of non-severe, severe, or very severe pneumonia is made.[4]

Non-severe pneumonia is managed with oral amoxicillin or co-trimoxazole in the community, but severe and very severe pneumonia are referred to the nearest health facility for treatment with injectable antibiotics. Referrals do not always go according to plan, because they entail transport costs, upkeep away from home, and possible loss of income to the family. Child care for children left at home can be difficult to arrange.[5] Such difficulties can lead to delay in treatment and worse outcomes.[6]

According to the Joint Learning Initiative on Health Resources for Health and Development, an extra 4 million doctors and nurses are needed worldwide to meet the Millennium Development Goals by 2015.[7] To fill this gap in health-care coverage, community health workers have been trained in simple preventive and medical care. Community health workers work in many countries, and among their other duties they provide basic preventive maternal and child health services at the community level.[8,9] These individuals are familiar to the community they serve, are respected, and are nearby. In Pakistan, there are lady health workers (LHWs) each of whom cares for 150–200 families and is affiliated with a basic health centre. She is supervised, receives regular retraining and proper reimbursements, and is an example of the integration of community health workers into a health service that achieves remarkable results.

In *The Lancet*, Abdul Bari and colleagues[10] report the outcome in children aged 2–59 months with

severe pneumonia who were managed by LHWs in the community, in a cluster randomised equivalence study undertaken in Haripur district, Pakistan. They compared outcomes between children treated at home with oral amoxicillin for 5 days with those in control clusters who were given one dose of co-trimoxazole and referred to the nearest health centre for further treatment. Treatment in the control clusters was in accordance with WHO's standard recommendation for severe pneumonia. The primary study outcome was treatment failure at 6 days; the secondary outcome was relapse between days 6 and 14. Of the children in the control clusters who were referred to a health facility, 92% actually attended.[10] A meta-analysis of nine studies of the effect of community health workers on pneumonia outcomes after the application of case-management guidelines showed reductions of 42%, 36%, and 36% in mortality rates in neonates, infants, and children younger than 4 years, respectively, mainly achieved through early diagnosis and referral.[11] Bari and colleagues' study is the first in which the actual administration of drugs by community health workers in the treatment of severe pneumonia is reported.

One could quibble over a few points in this study: fewer children were recruited into the control group (standard management) than into the home-treatment group (1477 *vs* 1995); and fewer children had fever (85% *vs* 93%) or very fast breathing (13% *vs* 18%) in the home-treatment group. Children in the control group were given various antibiotics, depending on the clinician's choice rather than in accordance with national guidelines. Nevertheless, with treatment failure defined as the continued presence of fever or lower chest indrawing on day 6, the results are unequivocally in favour of home treatment by the LHWs (9% *vs* 18%; risk difference 8·9%, 95% CI 5·4–12·4%) in this context.

The overall mortality rate for cases of severe pneumonia was very low—only three of 3472 children died.[10] The question arises as to whether many of the children needed antibiotics at all because the contribution of common respiratory viruses as the causative pathogen in children with clinical pneumonia is difficult to assess.

Community health workers have different levels and lengths of training in different countries and some have a heavy workload.[9] Not all community health workers are supervised as well as the LHWs in Pakistan and the HIV infection rate in Haripur is very low, so the implications of this study for HIV-endemic settings with a higher rate of mortality and treatment failure, and where the current recommendations for severe pneumonia are broad-spectrum injectable antibiotics, need to be assessed with caution.[12]

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A reduction in the childhood mortality rate of 25–30% could be achieved by well trained and motivated community health workers.[13] Bari and colleagues have given an example of how effective LHWs can be. Further phase 4 studies to monitor the effect of large-scale deployment of community health workers in this way might be needed to show whether their results can translate into an important reduction in infant and child mortality rates.

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The Global Fund: getting the reforms right

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As its Board meets this month in Accra, Ghana, for its 25th meeting, the Global Fund to fight AIDS, Tuberculosis, and Malaria finds itself at a crossroads.[1] Major reforms are needed to ensure its survival. The final report of a High-Level Independent Review Panel, which was tasked to examine the Global Fund's operations in light of allegations of fraud, made six recommendations.[2] The Global Fund, it argued, must transition from an emergency to a sustainable response; develop new risk-management approaches; strengthen internal governance; institute a new grant-approval process; strengthen decision making by middle management; and "get serious about results".[2] As the panel aptly noted, the Global Fund must "change or wither". The Global Fund Board has put in place an action plan that responds to these recommendations.[3]

The report, and the corresponding decisions of the Board, mark an important step towards the necessary improvements the Global Fund must make to fulfil its vital mandate in the coming decade and beyond. However, while the six recommendations are valuable, the report does not provide direction or solutions on certain critical issues that will define the further success and impact of the Global Fund.

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First, the Global Fund must do more to achieve its ambition to pioneer and embrace performance-based funding. The most important founding principle of the Global Fund was that it would, unlike decades of practice in foreign aid, distribute funding based on the achievement of results. As the report of the High-Level Independent Review Panel notes, the Global Fund's operations to date have fallen short of that goal: "the culture of the Global Fund has become one driven by the measurement of documentation, and not by health impact".[2] However, the Panel's recommendations to address this challenge will enable only marginal progress.

A strategic sea change is required for the Global Fund to truly become the performance-based institution it aspires to be. The UK has been at the forefront of thinking on performance-based funding under the current government, including through the development of cash-on-delivery aid approaches to global health priorities such as malaria and maternal mortality.[4] The Global Fund could make a similar shift to paying for impact instead of inputs. For example, recipients that have proven the ability to manage funding responsibly could receive carefully calculated payments for each standard unit of verified output or outcome, rather than the complex and burdensome disbursements based on inputs that are currently the norm. Further development could lead to carefully calculated standard payments per