Letters

Role of the Red Cross movement in Uganda's Ebola outbreak

Editor – With reference to the news item in the December 2000 *Bulletin* (pp.1476–1477) on the outbreak of Ebola haemorrhagic fever in Uganda in October–November 2000, I agree with the main conclusions about what seems to make a difference in the management of such outbreaks.

Ray Arthur's comments on the correlation between a more vigorous intravenous fluid replacement therapy and the higher survival rate compared with other outbreaks are reasonable. My own thought is that we were probably also dealing with different strains of the virus, some of them more virulent and lethal than others. Additional factors contributing to a better survival rate appear to be the early detection of cases and the tracing of contacts. One particular feature of this latest outbreak is the difficulty of reintegrating survivors into their own communities: they have suddenly become outcasts — expelled from home, their clothes burnt, and with no possibility of finding work.

Your news item mentioned a number of WHO partners as contributors to the relative success of the intervention. The International Committee of the Red Cross (ICRC) is mentioned, but not the International Federation of Red Cross and Red Crescent Societies or the Ugandan Red Cross. Many people do not realize the existence of three different components of the Red Cross movement; the work of national societies and the Federation is very often ignored, albeit unintentionally, so I should like to clarify who does what.

ICRC provides services and health care in conflict zones, while the Federation is the umbrella organization for 176 national societies, representing and supporting them. Such support includes the provision of guidance and standards and coordination of efforts. In emergencies, we support the national societies to do the actual work — and if the task is too big we also provide the necessary resources, as was the case in the Ebola outbreak.

There is one National Society per country, running support programmes that target the most vulnerable people in the population, both under normal circumstances and during emergencies. In this epidemic, the Ugandan Red Cross and the Federation trained scores of volunteers to do much of the house-to-house health information and education campaigning as well as case detection and, when cases were found, to make sure the patients presented for check-up and treatment. From my perspective, based on our previous experience in Gabon and the Democratic Republic of the Congo, this support was crucial and made a major contribution to the better outcome.

The problem with the discharged patients was detected quite early, so the same volunteers, plus additional ones, were trained to provide psychosocial support. This is an ongoing activity and we do not know as yet how effective it is — we are still learning. This is a complex issue, as there are many misconceptions, taboos and traditional belief-related factors to deal with. Once we have analysed the operation, the Federation and the Ugandan Red Cross plan to publish jointly an evaluation of the lessons we have learned. ■

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Applying DALYs to the burden of infectious diseases

Editor – I read with interest the critical examination of summary measures of population health by Murray and colleagues (*1*). The summary measure, disability-adjusted life year (DALY), that was developed in the Global Burden of Disease Study (*2*) has made a central contribution to the comparative assessment of disease burden. It is aggregated from disease-specific mortality and morbidity data including an appraisal of the severity of the functional consequences of the disease. The measure makes possible comparisons between health losses due to mortality and morbidity and health losses attributable to different diseases: the addition of disability results in a more realistic measure of disease burden than that obtained from mortality alone. DALYs may be used to evaluate health policies, to compare intervention alternatives, and to assess risk factors. A recent study of the relation between funding by the National Institutes of Health and the burden of disease showed that, except for AIDS and a few other diseases, the size of the burden in the USA was strongly predictive of the amount spent on research and development when disease burden was measured using DALYs (*3*).

Nevertheless, the limitations of DALYs are also recognized. DALYs do not cover multiple causes and long latency periods, nor do they capture discomfort, pain, suffering, stigma, or the social and economic consequences involved in many conditions, such as the burdens that maternal deaths cause in households and communities. Murray and colleagues acknowledged that certain issues are not reflected, including average levels of population health, reductions in health inequalities, responsiveness of the health system to legitimate expectations of the public regarding the non-health dimensions of its interaction with the system, and the fairness of health system financing (*1*).

Application of DALYs to burden analysis for infectious diseases may be even more challenging. Traditional mortality or life expectancy measures do not reflect the burden of most non-fatal chronic infectious diseases at all, even though the impact of these diseases is obvious. The DALY measure is a significant step in the right direction as it takes into account non-fatal disease burden, but it fails to address certain unique aspects of infectious diseases so may not necessarily reflect the true picture. First, there are large proportions of asymptomatic infections that may be inaccurately attributed to non-infectious chronic diseases in mortality or even in morbidity data. For example, according to available information, as many as

70–80% of individuals infected with hepatitis C virus are asymptomatic; up to 85% of those asymptomatic infections may become chronic hepatitis C, approximately 20% of which will become cirrhotic, including 5% or so who will develop hepatocellular carcinoma and eventually die of the liver damage (*4, 5*). However, most of those deaths are not classified as caused by hepatitis C in mortality statistics (Health Canada, unpublished data). Secondly, many infectious diseases have multiple chronic sequelae such as cancer, liver diseases and infertility, which have not been taken into consideration in burden analysis. Furthermore, the transmissibility of this group of diseases is probably its most important characteristic, but the burden that could be induced from such transmissibility has not been appropriately included in burden analyses such as the DALY measure. For example, each blood donor infected with a bloodborne pathogen may be able to spread the infection to several recipients through blood transfusion or to a larger number through blood products; among injecting drug users, one infected individual could spread a bloodborne infection to a whole network of users in a relatively short period of time; and contamination of a water or food supply by an enteric pathogen may cause infections in hundreds of individuals. Without inclusion of this aspect of infectious diseases, any analysis would result in significant underestimates of both the burden and its reduction through intervention such as vaccination, one of the most effective means.

Failure to recognize the above unique aspects of infectious diseases may in part explain the puzzling fact that the public, health care professionals and governments all express concern about infectious diseases, yet these diseases are always ranked low or at the bottom of most disease burden analyses. Measures for burden analysis should take into account the unique aspects of infectious diseases so that the derived burden estimates correctly reflect the impact of this group of diseases and can be used to evaluate the effectiveness of intervention strategies. ■

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Editor – The above letter by Shimian Zou highlights one of the fundamental issues in the construction of health gaps such as disability-adjusted life years (DALYs), namely the problem of causal attribution. In arguing that DALYs underestimate the burden due to infectious diseases, however, Zou fails to appreciate the distinct merits of the two major approaches to causal attribution — categorical attribution and counterfactual analysis — which we have discussed elsewhere (*1*). In brief, categorical attribution assigns every event such as a death to a single cause according to a defined set of rules; this approach has the advantages of being simple and comprehensible, and provides the intuitively appealing property of additive decomposition (i.e., the total burden equals the sum of the burdens attributable to each cause). The other major tradition, counterfactual analysis, determines the contribution of a particular cause to the overall burden by comparing the current level of burden to the hypothetical level that would prevail if that cause were reduced or eliminated. While the counterfactual approach provides a conceptually clear solution to the problem of multi-causality, it is considerably more complicated to compute and less easily understood. In the example that Zou cites, relating to hepatitis C and chronic liver disease, the health outcomes are not "inaccurately attributed" but simply attributed categorically, according to the conventions of the International Classification of Diseases. The Global Burden of Disease Study (*2*) also used a simple form of counterfactual analysis (population attributable risk) to calculate the total burden attributable to various diseases and certain risk factors (such as unsafe sex) that cause other diseases after long latency periods.

Zou notes that DALYs do not capture the social and economic consequences involved in many conditions. As discussed in our paper (*1*), DALYs are a health gap measure that quantifies loss of health for a population against a normative standard, and are not intended to be a measure of total well-being. However, DALYs do capture discomfort, pain, suffering and stigma, as these aspects of health states are taken into consideration in measuring disability weights.

It is important to emphasize that measuring the burden of disease and assessing the potential benefits of interventions are distinct, albeit related, goals. The issue of averting future transmission is more relevant to intervention analyses than to describing a population's health during a defined period. An intervention analysis requires a dynamic application of burden assessment in which changes in an entire future stream of burden are computed in order to capture the anticipated benefits of an intervention (*3*). Clearly, however, even assessment of burden in the current period reflects the transmissibility of infectious diseases.

Finally, it is worth mentioning that, contrary to Zou's assertion that infectious diseases are "always ranked low or at the bottom of most disease burden analyses", a glance at the leading causes of DALYs globally in 1999 (*4*) shows that infectious diseases occupy four of the 10 highest ranks, including acute lower respiratory infections (1st), HIV/AIDS (2nd), diarrhoeal diseases (4th), and malaria (8th). Measles and tuberculosis are also in the top ten ranks for developing countries. ■

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Even an HIV vaccine may not mean the end of AIDS

Editor – Data recently released by UNAIDS show the scope of the human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) pandemic, with a global total of 5.3 million new infections in 2000 (*1*). Every continent has been affected, though the developing countries are bearing the brunt. The most common mode of spread has been through heterosexual contact. Control and prevention of infection has generally been through information and education aimed at behavioural change: safer sex with the use of condoms has been promoted, injecting drug use discouraged, and needle exchange programmes introduced with varying success.

Some experts have suggested that the discovery of effective curative therapy and vaccine will be the "magic bullet" against HIV/AIDS, but I venture to dampen this optimism. Yes, an effective vaccine will be vital, so will effective, readily available and acceptable therapy. But availability is not enough, as experience has shown that other difficulties will stand in the way.

There have been vaccines against many communicable diseases for decades now, and the eradication of poliomyelitis from the western hemisphere is attributed to vaccination. But many other infections for which vaccines exist are still far from eradication. Of particular note are hepatitis B, tetanus and pertussis. In the case of hepatitis B, the vaccine is not generally available in many developing countries despite convincing evidence that it prevents infection and chronic forms of liver disease (e.g. cirrhosis and carcinoma). Other relatively new vaccines such as those against *Haemophilus influenzae* B and pneumococcal disease are still a rarity in the developing countries, where they are desperately needed.

The Expanded Programme on Immunization (EPI) has achieved remarkable progress in the prevention of childhood illness. But funding for EPI activities in many countries rests heavily with donor agencies. Malawi, one of the ten poorest countries, provides just 2% of its EPI budget. Will the goodwill that has sustained EPI activities continue and extend to HIV vaccines?

One feature unique to EPI vaccines is that they are given to children, not on the child's own volition but on that of the parents or guardian. If an eventual HIV vaccine is to be given to adults, different promotional skills will be required. Even the vaccines of childhood have been met with myths and misconceptions so that, in some cases, children fail to be immunized. A study in Zimbabwe published in 1999 (*2*) found that 55.6% of males and 64.6% of females felt they had no chance of being infected by HIV, yet the country seropositive level among adults aged 15 years and above is at least 15%, according to the National AIDS Control Programme.

The mode of delivery of an HIV vaccine would have to be considered carefully. If it were to be by injection, immunization against HIV could involve infection with hepatitis viruses in the process (*3*).

In case an effective therapy is discovered, who gets treated? For one thing, HIV testing is available in most industrialized countries (*4*) but not always in developing countries. There are areas of Malawi that are over 200 km away from the nearest testing centre, and the situation could be worse in other countries. Where antiretrovirals (ARVs) are available, at least in private practice, their use may be irresponsible (*5*). In a study in Zimbabwe the conclusion was that there was "therapeutic anarchy in the private sector in the way ARVs were being used" (*6*), thus creating a situation for the emergence of drug resistance and the consequent need to develop further generations of the drugs.

Perhaps it would be necessary to exercise surveillance of drug administration, in a way similar to the DOTS (directly observed therapy, short course) strategy that is being implemented for tuberculosis. But DOTS has not worked everywhere, and all the requirements for an effective DOTS programme — fully supervised therapy, laboratory diagnosis, reliable drug provision, effective monitoring and political commitment — are but a dream to most countries heavily affected by tuberculosis (and HIV/AIDS).

The issues I have raised, though depressing, are worth consideration, as it is not enough to manufacture vaccines or medications and think that patients will use them properly. That has not been the case with any other intervention in public health, because of the complexity of human behaviour. It is tempting to think that a cure will mean the end of HIV/AIDS, but we have cures for malaria, for example, and yet over 3 million deaths occur annually from the disease. ■

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