

Chapter 5

Advances in selected priority areas

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Summary

The 1996 Ad Hoc Committee Report made a series of recommendations for research activities within each of the selected priority areas. The document's projections to the year 2020 indicate that there will be a marked decline in the burden from communicable diseases, maternal, perinatal and nutritional conditions, the so-called "unfinished agenda". However, that decline cannot be taken for granted unless efforts to reduce the disease burden are sustained. An essential component of research on the "unfinished agenda" is to provide the information base for the introduction of health interventions.

Chapter 5 explores current advances in selected priority areas and reviews recommendations for research. It argues for the need to study the impact of reproductive health and nutritional status on child health and the links between child health and the development of diseases in adult life (the "life cycle approach"). The chapter reviews some priority research areas in reproductive health including maternal mortality, HIV and STD transmission, unwanted pregnancy and adolescent health. It highlights the lack of information on the burden of reproductive ill-health and argues that it is difficult to develop and implement the evidence-based health programmes needed to improve reproductive health without baseline information.

To illustrate the magnitude of the problem of dealing with the "double burden", this chapter also focuses on mental health and neurological disorders in developing countries. The framework for the priority-setting matrix referred to in Chapter 2 is used here to illustrate the five-step priority-setting process as applied to epilepsy. Finally, the chapter refers to road traffic accidents as an important component of injuries in developing countries.

Introduction

Chapter 4 identified priority areas for research under the “double burden” of communicable diseases, maternal, perinatal conditions and nutritional deficiencies, noncommunicable diseases and injuries. It concluded that the various approaches reviewed resulted in a very similar list of health problems and conditions, reflecting the disease burden experienced at the global level.

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Section 1

Child health, communicable diseases and perinatal conditions

1. The problem

Every year, about 11 million children die before they reach their fifth birthday – most of them in low- and middle-income countries. Of these, about 8 million children die from no more than five conditions: pneumonia, diarrhoeal diseases, malaria, malnutrition and measles. Others suffer infections that

are preventable with currently available vaccines or medicines. Among the top ten causes of DALYs in 1998, children largely account for the first three conditions (lower respiratory infections, perinatal conditions and diarrhoeal disease representing over 17% of total DALYs)¹ and play an important role in the fourth one (HIV/AIDS). Malaria is

¹ C.J. Murray, WHO. Paper presented at Forum 3, June 1999.

estimated to kill over one million children a year in Africa alone, and accounts for 4.5% of DALYs in children aged 0-4 years. In addition, it is estimated that 7.7 million perinatal deaths occur each year (4.3 million foetal deaths and 3.4 million neonatal deaths), 98% of them in the developing world. While in the United States, the rate of neonatal deaths is 5 per 1000 live births, in the developing world 40 newborn babies die for every 1000 live births.

For children who survive, the period of childhood involves exposure to certain risks. And the effect of that exposure can be more detrimental to children than adults. Recent evidence suggests that risk factors for much of adult illness can be traced back to childhood or even to the period in the womb.² However, while genetic make-up is important, it may function primarily by making individuals more susceptible to other risk factors relating to behaviour and the environment. Examination of adult disease through the study of maternal and childhood risk factors – biological, social and environmental – is known as the “life cycle approach”. This approach to illness needs to be examined in developing countries, through a series of questions that explore the link between childhood risk factors and adult disease.

Ad Hoc Committee recommendations on child health research

The Ad Hoc Committee Report went beyond the identification of priority areas, and recommended the following activities for child health research:

- Evaluate and refine the package for the Integrated Management of the Sick Child.
- Understand the relative importance, in different environments, of increased

nutrient intake and controls on infectious disease as a means to reduce malnutrition.

- Evaluate promotion of insecticide-impregnated bednets, possibly for inclusion in a future healthy household package.
- Increase efficiency of EPI.
- Evaluate the efficacy and optimal dosage of vaccines (rotavirus, conjugate pneumococcal and Hib) in low-income countries.
- Develop vaccines for malaria and for HIV.

Since the recommendations made by the Ad Hoc Committee in 1996, there have been varying degrees of progress in each of these areas. This section does not attempt to review progress for each of the priorities but rather looks at current thinking on a few of these priority areas in which little progress has been made. The selected areas include: research activities on the perinatal period; malnutrition and nutritional deficiencies; and environmental risk factors, such as indoor air pollution as a critical risk factor for acute lower respiratory infections.

2. Perinatal period

While infant mortality rates have fallen steadily in most developing countries, neonatal death rates continue to remain high, currently accounting for one third of all deaths among children under the age of five in developing countries. The most important reasons for the continuing high rate of neonatal deaths are demographic factors, health system inadequacies and lack of training for community health workers. In developing countries, most pregnant women do not have access to adequate health facilities and have inadequate diets without the food supplements they need. In addition, they do

² R. Cash. Paper presented at Forum 3, June 1999.

not have access to interventions for the management of pre-eclampsia, or treatment for bacterial vaginosis, malaria and sexually transmitted diseases. Meanwhile, their babies do not receive appropriate care immediately after birth, such as cord and skin care and temperature regulation.

Recommendations for research

Research on interventions that could reduce perinatal and neonatal mortality fall into two categories³:

(i) interventions for which the knowledge base is adequate but which still require research on strategies for implementation:

- prenatal tetanus immunization
- increased maternal education
- increased caloric intake during pregnancy
- iodine supplementation during pregnancy
- umbilical cord care, and management of diarrhoea and pneumonia in the newborn period.

(ii) interventions for which basic information on efficacy is required:

- treatment of bacterial vaginosis to prevent pre-term, low birthweight deliveries and neonatal deaths
- simple regimen for the treatment of malaria during pregnancy
- immunization before and during pregnancy to prevent pneumococcus and *H. influenzae* type b during the neonatal period
- use of simple algorithm for detection and management of sepsis in newborn babies
- use of simplified antibiotic regimen (once a day intramuscular or oral therapy) for the treatment of sepsis

- micronutrient supplementation (zinc and vitamin A) for both mothers and infants
- prevention of neonatal morbidity and mortality through control of organisms other than bacteria, such as toxoplasmosis, cytomegalovirus and herpes simplex virus
- cost-effective methods to train mid-level health workers in the management of pre-eclampsia, neonatal care and appropriate management of labour and delivery.

3. Malnutrition and nutritional deficiencies

An analysis of the burden of disease in 1995 due to selected risk factors revealed that malnutrition – which mainly affects young children in developing countries – accounted for 16% of the total burden.⁴ As many as one in two childhood deaths may be related to some degree of malnutrition, a condition which has deep roots in poverty and disease.

An attempt was made to calculate the burden of micronutrient deficiency resulting from malnutrition.⁵ Current estimates do not incorporate cognitive impairment, the effect on low birthweight or the impact of the deficiency as a risk factor in deaths. When these factors are taken into account, the current estimates of disability – due to vitamin A deficiency, for example – could be increased as much as tenfold.

The birthweight of an infant is an important indicator of maternal health and nutrition prior to – and during – pregnancy and a powerful predictor of infant growth and survival. The extent of the global burden of low birthweight is not currently available, but indirect estimates indicate that 17% of all

³ M. Santosham, Johns Hopkins University. Paper presented at Forum 3, June 1999.

⁴ C.J. Murray, WHO. Paper presented at Forum 3, June 1999.

⁵ R.E. Black, Johns Hopkins University. Paper presented at Forum 3, June 1999.

births worldwide involve low birthweight babies (below 2500g at birth), of which most (90% or approximately 22 million) are born in developing countries.⁶

Risks

Malnutrition is important not only because of its immediate effects on the individual but also because of its long-term impact. For example, studies in The Gambia indicate that people born during the annual “hungry season” are 10 times more likely to die prematurely in young adulthood. There is a close relationship between disease and malnutrition, with high rates of infectious diseases resulting in further losses of nutrients and increasing metabolic demands.

Low birthweight infants are at a higher risk of high rates of morbidity and mortality from infectious disease: growth failure including stunting, abnormal cognitive development, neurological impairment and poor school performance, and premature mortality from cardiovascular disease, hypertension and diabetes.

Research recommendations

- Interventions to reduce low birthweight
- Prompt implementation of interventions for the management of diseases and conditions in low birthweight children
- Improvement of nutritional status of the family and the population through development efforts
- Breaking the vicious cycle of infection and malnutrition
- Rehabilitation and early stimulation of low birthweight infants
- Investigation of the prevalence of micronutrient deficiency and anaemia in young children
- Description of the functional consequences of micronutrient deficiencies

- Interventions involving food fortification or dietary changes
- Operations research to improve implementation of existing interventions
- Cost-effectiveness comparison of interventions
- Evaluation of the long-term consequences of influences in childhood
- Establishment of the role of childhood diets on the development of noncommunicable diseases.

4. Environmental risk factors

Children are exposed to a range of health risks within their environment. In many developing countries, children play, or work, in environments that are detrimental to health. Poverty is perhaps the most important determinant of this exposure to environmental risk. Contaminated drinking water, for example, increases the risk of enteric infections (including *H. pylori*, cholera and shigella) and crowded and substandard housing increases the risk of tuberculosis and other respiratory infections. Lead poisoning from contaminated food products or polluted air contributes to slow growth and learning disabilities. Meanwhile, the long-term effects of pesticide poisoning and the presence of hazardous wastes in the soil where children play are additional risk factors.

About three quarters of the total global burden of exposure to particulate air pollution is experienced indoors in developing countries. Young children are at high risk of exposure because they are usually with their mothers around the cooking area. About 20 observational studies established a two-to-five times higher risk of acute lower respiratory infections in children exposed to indoor air pollution. However, the relationship between exposure to indoor air pollution and the development of acute lower

⁶ G. Fuchs, Centre for Health and Population Research, Bangladesh (ICDDR,B). Paper presented at Forum 3, June 1999.

respiratory infections has not yet been quantified.

Research recommendations⁷

The use of biomass fuel indoors is an important determinant of exposure to indoor air pollution. New research is needed on a combination of measures: technical interventions (remove smoke, improve stoves, modify house design and review methods of fuel use); behavioural interventions (promoting awareness, infant protection measures); and policy-level interventions (fuel pricing, training). All these interventions will have to be assessed as part of research to

determine the cost-effectiveness of different combinations of interventions.

The burden of disease figures for childhood and nutritional factors are very high, underscoring the importance of the research, development and implementation of new interventions. The health-related issues presented in this section highlight the interaction between child health, nutrition and the environment. Strategic research on this to define new interventions must be accompanied by the implementation of existing cost-effective tools.

Section 2

Reproductive health: the burden and challenges

1. Introduction

Reproductive health encompasses a large group of conditions and interactions. These include maternal morbidity and nutritional deficiencies, HIV and maternal mortality, STDs and HIV/AIDS, maternal health and perinatal outcomes, unwanted pregnancy, unsafe abortion and poor child and adolescent health, amongst others. Linkages between components have been poorly described and the selection and evaluation of interventions to improve the reproductive health status of a population have not yet been fully explored.

Since very little information is available in developing countries, there is an urgent need for countries to step up their research activities in this area.

Ad Hoc Committee recommendations on maternal health

The Ad Hoc Committee Report recommended the following activities for maternal health:

⁷ N Bruce, University of Liverpool. Paper presented at Forum 3, June 1999.

- Develop, evaluate and refine the mother-baby package for pregnancy, delivery and neonatal care.
- Evaluate the implementation of a range of family-planning packages offering a wide choice of methods.
- Develop new contraceptive methods, particularly to widen the choice of long-term, but reversible methods, post-coital methods for regular and emergency use and methods for men.
- Develop improved methods for the diagnosis, prevention and treatment of STDs.

A number of research groups in both developed and developing countries are conducting research in these priority areas. In addition, there are other critical issues in reproductive health research which are not included in the selected priorities.⁸ This section reviews progress in some of the priority areas identified in the Ad Hoc Committee Report. It also identifies risk factors and proposes recommendations for research on the measurement of the reproductive health burden and on challenges to reproductive health programmes. Challenges explored in this section include the increase in the adolescent population, issues relating to maternal mortality and unwanted pregnancy, vertical transmission of HIV and operational research on sexually transmitted diseases.

2. Burden and measurement

There is a lack of data on reproductive health issues and inadequate use of available data, as well as continuing ignorance about many of the distal and proximate determinants of poor reproductive health.

A presentation during Forum 3⁹ defined two types of research issues related to reproductive ill-health: (i) issues relating to the measurement of burden (broaden the definition, improve disability weights and epidemiological information, explore the relationship between reproductive health and infant health outcomes); and (ii) research directed at reducing the burden (behaviour, vaccines, operations research and programme interactions).

An informal consultation on DALYs and reproductive health¹⁰ identified the following areas of reproductive ill-health which were “neglected” in the GBD 1990 study:

- indirect obstetric conditions (malaria, anaemia, hepatitis, diabetes, epilepsy, cardiovascular disease)
- gynaecological morbidity (viral STD, reproductive tract infections, female genital mutilation and harmful practices)
- contraceptive-related morbidity and side effects
- psychological morbidity including puerperal psychosis
- infertility
- HIV-attributable morbidity
- linkages between STDs and HIV
- stillbirths.

3. Incorporating adolescents in reproductive health research

The World Bank estimates that this year the world will experience the largest generation of adolescents ever: about 800 million teenagers. However, the phenomenon of this rapidly expanding adolescent population aged 12-19 years has been largely overlooked.

Adolescents are at a high risk of STDs, including HIV, potentially harmful substances

⁸ A. de Francisco, Global Forum for Health Research. Paper presented at Forum 2, June 1998.

⁹ R. Sadana, WHO/EIP. Presentation at Forum 3, June 1999.

¹⁰ DALYs and Reproductive Health: report of an informal consultation, April 1998 (WHO/RHT/98.28).

(tobacco, alcohol and other drugs) and violence and sexual abuse perpetrated by adults.

Research recommendations

Discussions resulting from the session on adolescent reproductive health during Forum 3 recommended the following broad areas of research on adolescence:

- improve the availability of basic data on the reproductive health status of adolescents
- identify effective and sustainable interventions that will have an impact on behaviour or health outcomes
- implement interventions research in the field of adolescent health and development in developing countries
- undertake research on the mediating factors that need to be addressed if interventions are to be effective

4. Pregnancy-related mortality and safe motherhood

Every year more than half a million women die as the result of complications of pregnancy and childbirth – most of them in developing countries. The differential in the lifetime risk of maternal death is one of the starkest indicators of the 10/90 gap: from an extreme of 1 in 7 in the highest risk developing country to 1 in 9,200 in the lowest risk developed country.

Over 80% of all maternal deaths are due to abortion, hypertensive disorders, haemorrhage, obstructed labour and infections. And for the most part, the interventions needed to prevent such deaths are known and cost-effective. What is lacking, however, is the ability to implement them successfully in resource-constrained settings. Further research is needed in some areas. For example, there is a need for better

information about the incidence, determinants, long-term consequences and prevention and management of hypertensive disorders of pregnancy and intra-uterine growth retardation, which account for a large proportion of morbidity and mortality among women in developing countries. Research should also be carried out to evaluate the determinants of the attitudes and practices of women in seeking health care during pregnancy and childbirth as well as to identify and implement effective approaches for overcoming barriers to use of health-care services.

Unsafe abortion resulting from unwanted pregnancy remains a serious public health problem in much of the developing world.¹¹ It is estimated that between 40 and 60 million abortions are carried out every year worldwide. Of these, WHO estimates that about 20 million are unsafe, 90% of them in developing countries.

The discussions during Forum 3 on research needs to help reduce the burden of maternal ill-health led to the following recommendations:

- Evaluate the determinants of health-seeking behaviour by women during pregnancy and childbirth and identify and implement effective approaches for overcoming barriers to use of health care.
- Evaluate the biological determinants of key pregnancy-related complications and design interventions to prevent them.
- Estimate the prevalence, health consequences and cost to health services of unsafe abortion in the developing world.
- Evaluate the gender dynamics of sexual behaviour and contraceptive use.
- Identify ways to ensure the availability and use of interventions for the management of

¹¹ J. Cottingham, WHO. Presentation at Forum 3, June 1999.

pregnancy-related complications in resource-poor settings.

- Describe the incidence, determinants and long-term consequences of hypertensive disorders of pregnancy, unsafe abortion and intra-uterine growth retardation.

5. Integration of reproductive health interventions: pregnancy and HIV transmission

Burden

Over 33 million people worldwide are infected with HIV – over 95% of them in the developing world. Every day there are an estimated 16,000 new infections, mainly in sub-Saharan Africa, of which 10% are newborns. By the year 2004, it is estimated that an additional 14 million people will develop AIDS and die in this region. In addition, up to one third of babies born to HIV-positive women are likely to be infected if untreated.

The African region also accounts for some of the highest birth rates and levels of maternal mortality. In 1990, the global maternal death rate per 100,000 live births was estimated to be 430 as compared to 980 in sub-Saharan Africa. Meanwhile the estimated death rate from HIV/AIDS per 100,000 women aged 15-44 was 7.7 globally and 78.5 for sub-Saharan Africa. The projections for HIV transmission rates in Asia are projected to surpass transmission rates in Africa over the coming decades.

Risks

Presenting the information for HIV and maternal mortality separately poses two problems, as was argued in a paper presented during Forum 3.¹² Focusing on outcomes solely in the mother conceals the impact on the survival and well being of other

individuals, directly in the case of mother-to-child transmission of HIV and perinatal deaths, and indirectly in terms of orphans and other household members.

Research recommendations

Current research studies that focus on single interventions need to be redirected towards integrated initiatives, delivering effective interventions in pregnancy and childbirth. For example, providing a skilled attendant at delivery is the single most critical intervention for safe motherhood. Recent results from various randomized trials have shown that a short-course of zidovudine given to HIV-infected pregnant women during the later stages of pregnancy and delivery can reduce the risk of transmission of HIV by half in the absence of breastfeeding, and by one third in breastfeeding populations. Research on the combination of these interventions is described in insert 5.1.

6. STD management in developing countries and the need for research

The limited data available show that STDs are an important public health problem in most developing countries. However, most STDs are asymptomatic, and their control requires approaches such as case detection or presumptive/mass therapy.¹³ Vaginal discharge is one of the most difficult syndromes to manage. It is not easy to distinguish between the conditions most commonly associated with vaginal discharge and the less common but more serious cervical infections due to gonococcal or chlamydial infections. Unfortunately, appropriate tools for the detection of most STDs are not yet available. WHO recommends the use of the syndromic treatment as the most realistic approach for the management of symptomatic patients presenting for primary care in developing

¹² W.J. Graham, Aberdeen University. Paper presented at Forum 3, June 1999.

¹³ C. Soliman, FHI. Paper presented at Forum 3, June 1999.

countries. While the first generation algorithms lacked the sensitivity needed to manage cervical infections, the introduction of risk assessment increased sensitivity at the expense of specificity. Given that risk factors for cervical infection may vary in different settings, the recommendation was to evaluate and adapt the charts.

Research recommendations

Three types of research are critical to the practical implementation of control measures for sexually transmitted diseases:

- (i) Strategic research, to focus on increasing the understanding of specific pathways and interactions between conditions and risk factors.
- (ii) Identification of new tools to improve package content, such as diagnostics to improve the identification of cases.
- (iii) Operational research aimed at package development and evaluation (adaptation, implementation, improvement and evaluation of the available treatment guidelines).

In the meantime, health managers in developing countries should continue to implement current recommendations pending results from the research described in (i) and (ii) above.

Insert 5.1

Recommendations for integrating pregnancy and HIV transmission research interventions¹⁴

1. At the physiological level, undertake research on:

- The impact of single and repeated courses of short-course antiretrovirals on HIV progression and pregnancy-related complications in mothers and infants.
- The effect of pregnancy and pregnancy-related complications on HIV seroconversion and disease progression.
- The effect of HIV status on pregnancy outcomes and risk of pregnancy-related complications including life-threatening septic abortion.

2. At the individual, family and community level, undertake implementation and interventions research on:

- Safe sex during pregnancy and the puerperium.
- Community mobilization to promote the provision and utilization of quality maternity services.
- Acceptability of voluntary counselling and testing provided through maternity services.
- Vaginal lavage to reduce vertical transmission of HIV and puerperal infection.
- Role of micronutrients in maternal health for both HIV-positive and HIV-negative women.

3. At the health sector level, undertake implementation research on:

- Integrated initiatives to ensure high quality intrapartum care with skilled attendants.
- Implications of HIV and mother-to-child-transmission for antenatal care provision.
- Impact on quality of care of health-care provider of perceived risks of contracting HIV infection.

4. At the international level, carry out research and development work to identify indicators reflecting the synergy between maternal conditions and HIV. Cost-effectiveness studies comparing the various interventions are critical.

Information on the levels described above will be incorporated in the framework for priority setting described in Chapter 2 once the information becomes available.

¹⁴ W.J. Graham, Aberdeen University. Paper presented at Forum 3, June 1999.

Section 3

Noncommunicable conditions: mental health and neurological disorders in developing countries

1. Introduction

In the face of rapid demographic and epidemiological changes and the growing burden of noncommunicable diseases, developing countries can no longer focus exclusively on communicable diseases. Yet developing countries are not prepared for the coming epidemic of noncommunicable diseases and injuries in addition to the “unfinished agenda.”

Life expectancy at birth, infant mortality and the causes of death remain important health indicators in developing countries. But it is increasingly evident that these indicators are no longer sufficient for the formulation of health-care policy and for monitoring the health of the population. The speed of change and longer life expectancy at birth are important reasons why developing countries need to adopt newly developed indicators such as disability-free life expectancy or healthy-life expectancy.

To illustrate the magnitude of the problem of dealing with the “double burden” for the health services. This section focuses on mental and neurological disorders in developing countries. The matrix referred to in Chapter 2 is used here to illustrate the five-step priority-setting process as applied to epilepsy.

2. Assessing the burden of mental health and neurological disorders

Mental health and disorders of the nervous system (the brain and optic nerves, retina, spinal cord, peripheral nerves, neuromuscular junction and muscle) account for a large and increasing proportion of the world's disability and mortality. These disorders include the consequences of foetal and childhood malnutrition and other causes of birth defects and developmental disabilities, mental retardation, depression, schizophrenia, epilepsy, brain infections such as HIV encephalitis or cerebral malaria, environmental neurotoxins, head injury, stroke, degenerative disorders such as Parkinson's disease and Alzheimer's disease, chronic pain and a myriad of genetically-determined disorders.

It is projected that mental and neurological disorders could increase their share of the total global burden from 10.5% in 1990 to 15% by 2020. For young adult males in the developing world, alcohol use, depressive disorders and psychoses are among the ten leading causes of ill-health and premature death. For young adult females the most frequent disorders are depressive disorders and schizophrenia. Mental retardation is estimated to have a prevalence rate of 4.6% among children below the age of 18 in developing countries and imposes a considerable burden on the social welfare and educational systems. The treatment and rehabilitation of individuals affected with mental and neurological disorders account for

25% of the health-care budget in established market economies.¹⁵

In order to provide an example of the practical framework for setting priorities in health research presented in Chapter 2, the proposed matrix is applied to research on epilepsy (Insert 5.2). The matrix can be applied to any mental or neurological disorder to present information on gaps for research. There is a critical need for research to describe the actual burden of mental and neurological disorders in developing countries. The distress caused to patients and their families, the violence against women, marital break-up and the resulting damage to children's development are not reflected in the current estimates. Research on the burden should be coupled with development of cost-effective prevention and treatment and with efforts to create the right environment to implement these programmes, including development of a mental health policy and provision for community-based treatment.

3. Mental health policy and reform

Most countries are undergoing some degree of reform in their approach to mental health care. This involves a move away from old-style custodial and institutional care in community settings to care which is local, needs-led, and the least restrictive environment that is compatible with the health and safety of affected individuals, their family and the public. Many countries are also contemplating reform of the legislative framework so that it supports appropriate care in the community, enabling professionals to deliver care in flexible settings, with appropriate attention to human rights. Both these movements require reform in other areas: reform of the training for mental health professionals and primary care workers and

reform of the inter-sectoral links that are needed to deliver mental health care: primary care and secondary health care, social care, housing, welfare benefits, the criminal justice system, education and industry.

While each country has special needs, problems and challenges, there are some fairly consistent principles for mental health reforms.¹⁶ It is critical to ensure that decision-making about services is needs-led rather than supply-led. Thus, while it is important to know about pre-existing service use, estimates of need should be based on absolute levels of disease, severity, disability, chronicity and risk.

Research on the essential elements of mental health policy is critical to understand and replicate success stories. As countries move along the path of mental health reform, there is much that can be learnt from the experience of others, whether at national, regional or local level. There is a need for constructive partnerships between institutions for the sharing of research findings.

In summary, the clear articulation of the burden of mental and neurological disorders is an important step but only a first step towards the promotion of mental health in the general population and the provision of services for the mentally ill. The recognition of burden will largely remain an academic exercise if this cannot be translated into interventions. While there is an impressive set of therapeutic methods and even preventive interventions, research on assessing their cost-effectiveness under different socioeconomic and sociocultural conditions remains a high priority. Given the many gaps in the science of mental and neurological disorders, resources should be allocated to well coordinated research on specific areas.

¹⁵ D. Silberberg, University of Pennsylvania. Paper presented at Forum 3, June 1999.

¹⁶ R. Jenkins, Institute of Psychiatry, London. Presentation at Forum 3, June 1999.

Section 4

Road traffic injuries and childhood injuries in developing countries

Introduction

Injuries are increasingly recognized as one of the new global public health epidemics. The epidemic of injuries is also predicted to be one of the most challenging, as health systems are largely ill-prepared to respond to this problem. Evaluations of the burden of disease in developing countries reveal that between 5% and 25% of the overall burden may be attributable to injuries.

Within injuries, road traffic accidents are the leading cause of loss of healthy life at the aggregate level where such estimations are available. Most of those injured, disabled or killed in road traffic accidents are in the younger age groups and very often in the most productive age groups. Practical measures instituted in the developed world, such as seat belt legislation and the use of airbags, are likely to fail in the developing world because of difficulty in enforcing such regulations (see Insert 5.3).

Research recommendations¹⁷

- Describe the magnitude of the problem, the epidemiology and burden of disease of road traffic injuries in developing countries.
- Describe risk factors for road traffic injuries in the developing world, including regional and national profiles in terms of effects on the poor, gender differences and age groups.
- Define effectiveness and cost-effectiveness of both current interventions and interventions not being implemented in developing countries for reducing this burden.
- Describe behavioural determinants.
- Describe legislation required to implement programmes in developing countries.

¹⁷ From the group on Road Traffic Accidents discussions during Forum 3, June 1999.

Insert 5.2

Epilepsy – risks, obstacles and opportunities for interventions: application of the five steps for priority setting

Actors/factors determining the health status of a population	
Five Steps in Priority Setting^(a)	Level of the individual, family and community
II. Why does the burden persist? What are the determinants?	Infections during pregnancy ^(b) Birth asphyxia ^(b) Brain injury during labour ^(b) Head injury Exposure to toxic substances (lead, alcohol) Infectious and parasitic diseases Febrile convulsions ^(b) Genetic predisposition
III. What is present level of knowledge? a. Interventions currently available	Health education programmes aimed at: <ul style="list-style-type: none"> • Seeking and accepting preventive care • Seeking, accepting and complying with drug treatment • Avoidance of excessive risk (head injuries through accidents) Psychosocial support programmes
b. How cost-effective are current interventions?	Cost-effectiveness studies on individual interventions are extremely rare. An overall assessment of the cost-effectiveness of whole intervention "packages", however, is possible (see IVb below).
IV. What is to be expected in the future? a. What types of interventions are under consideration?	Community awareness programmes on epilepsy, aimed at dispelling stigma and at promoting a positive attitude to people with epilepsy in the community. Programmes to help people with epilepsy to understand their condition and to empower them to seek appropriate treatment and lead fulfilling lives. Assessment of the relative contribution of individual preventive interventions to reducing the burden of epilepsy.
b. How cost-effective could future interventions be?	The prevalence of epilepsy in the population ranges from 3-5 per 1000 in the This tenfold difference in prevalence provides a measure of what could be
V. What are the resource flows?	A global campaign was launched in June 1997 by the International Bureau for Since then, 27 countries have joined or are planning to join the campaign (14 Resources for this campaign are grossly inadequate.

^(a) Step I is the burden of disease calculated for epilepsy at 5.1 million DALYs worldwide.

^(b) These factors are listed under the heading "Individual, family, community" as they refer to the responsibility of the individual, family and community to either seek help or arrange for such help to be available

Actors/factors determining the health status of a population (intervention levels)

Level of the health ministry, health research institutions, health systems and services	Level of sectors other than health
<ul style="list-style-type: none"> • Inadequate prenatal care • Unsafe delivery • Untreated or inadequately treated fever in children • Exposure to parasitic and infectious diseases • No genetic counselling • No or inadequate drug treatment (in terms of availability and compliance) • Patients and families lack knowledge on appropriate lifestyle 	<p>Accidents, particularly head injuries (in the workplace, traffic-related).</p> <p>Restrictive and discriminatory legislation. Prejudice and stigmatization lead to social handicap, including unemployment.</p> <p>Uncontrolled industrial and agricultural development may entail environmental pollution by toxic agents, e. g. with lead or pesticides (particularly chloride derivatives).</p>
<p>Establishment of an organized community health care system providing:</p> <ul style="list-style-type: none"> • Prenatal care • Safe delivery • Control of fever in children • Control of parasitic and infectious diseases • Immunization • Control of fever diseases such as diphtheria, pertussis, tetanus, measles, tuberculosis • Drug treatment (e.g. phenobarbitone) • Genetic counselling for people with severe forms of inherited epilepsy 	<p>Information programmes about the nature of epilepsy in schools, in the workplace and in the community to prevent social handicap.</p> <p>Anti-pollution programmes to prevent exposure to toxic agents, e.g. in the workplace.</p> <p>Psychosocial and vocational rehabilitation.</p> <p>Removal of restrictive and discriminatory legislation.</p> <p>Measures and legislation to prevent accidents, particularly at work or in traffic.</p>
<p>With early anti-epilepsy drug treatment, 80% of patients go into remission (many permanently) both by suppressing seizures and by inhibiting the evolution of the epileptic process.</p> <p>It has been demonstrated that in developing countries the establishment of an organized community health care system providing prenatal care, maternal and child care programmes, vaccination and nutrition programmes can reduce the prevalence of epilepsy from 37/1000 to 5.3/1000.</p>	<p>Cost-effectiveness studies on individual interventions are very rare. An overall assessment of the cost-effectiveness of whole intervention “packages”, however, is possible (see IVb below).</p>
<p>Training and educating health professionals.</p> <p>Strengthening the health and social services so that they are better equipped to apply preventive, curative and rehabilitative interventions, such as:</p> <ul style="list-style-type: none"> • Reducing the treatment gap • Reducing the physical and social morbidity of people suffering from epilepsy. 	<p>Development of national programmes on epilepsy. Establishment of a platform for general awareness on epilepsy:</p> <ul style="list-style-type: none"> • Announcement of a Global Awareness Day for Epilepsy • Organization of regional conferences on public health aspects of epilepsy. <p>Development of a model for the promotion of epilepsy control worldwide and for its integration in the health systems of countries.</p> <p>Development of specific programmes designed to:</p> <ul style="list-style-type: none"> • Reduce risks of head injuries (e.g. in the workplace, traffic-related), toxic exposures, environmental pollution • Fight stigma in the workplace • Eliminate discriminatory regulations and legislation.

industrialized world to 15-20 or even 50 per 1000 in some areas of the developing world. accomplished by a comprehensive programme of prevention in the developing countries.

Epilepsy (IBE), the World Health Organization (WHO) and the International League Against Epilepsy (ILAE). countries in Europe, 8 countries in the Americas, 3 in Africa, 2 in Asia).

Insert 5.3

*Burden of road traffic injuries in Latin America and the Caribbean*¹⁸

Road traffic accidents are an important problem in Latin America and the Caribbean countries. However, there are very few data on the mortality and morbidity involved, road traffic patterns, or which interventions are most likely to be successful. Even though there is a great deal of variability between and within countries, the scant information available is highly aggregated.

In some countries, mortality rates per 100,000 for injuries (including unintentional and intentional injuries) vary from 53 in Peru and 59 in Puerto Rico to 201 in El Salvador. Among all fatal injuries, road traffic injuries are the most common cause of death for people aged 1-45, and a significant cause of death at all ages in Latin America and the Caribbean countries. According to WHO, in 1990 109,000 people in this region died as a result of traffic injuries, and this number could rise to 143,000 by the end of 2000. The number of deaths peaks in the late teenage years and early twenties and the majority are males aged 15-29. An example of the differences within a country is Mexico, where the overall mortality rate for traffic injuries in 1996 was 16.1 per 100,000 deaths for the country as a whole and 28.4 per 100,000 in the state of Baja California Sur. Research in this field developed in Mexico City, one of the largest cities in the world, showed that in 1996, 13,543 people died from traffic injuries, and that 55% of those deaths were due to fatal pedestrian injuries.

With an increase in the population of young men, the number of DALYs lost to road traffic accidents will also rise even though there may be no concomitant increase in mortality rates. In this sense, the net effect on projected DALYs from injuries in Latin American countries and the Caribbean is increasing.

¹⁸ M. Hajar, National Institute of Public Health, Mexico. Presentation at Forum 3, June 1999.