

Well-structured and appropriate diabetes education is inadequate, both for people with the disease and health-care providers. Most countries do not have a national diabetes programme. Without countrywide preventive measures, the deadly combination of communicable and non-communicable diseases will disable and kill millions of people, and will further stifle economic development in the regions where growth is needed most. The difficulties highlighted in the 2006 World Diabetes Day campaign need efforts beyond the health-care sector: the food and drink industry, nutritionists, educators, and the community at large must play a key part.

Clearly, the unified voice of the UN is needed to impress these facts on the world. Thus the International Diabetes Federation is leading a global campaign for a UN resolution on diabetes, which encourages UN member states to develop national policies for treatment, care, and prevention of diabetes within the sustainable development of their health-care systems. With diabetes advancing so rapidly in south Asia, it is fitting that the People's Republic of Bangladesh is the lead sponsoring country behind the resolution. If nothing is done to reverse current trends, by 2025 Bangladesh is expected to be one of the ten countries with the largest number of people with diabetes.⁶

Dying of diabetes

See [Review](#) page 1689

What is the commonest cause of death in a child with diabetes? The answer—from a global perspective—is lack of access to insulin. Families in the poorest parts of the world must make a choice between insulin for one child or starvation for the rest. The consequence, in parts of India—which has more people with diabetes than any other country in the world—is that girls are missing from the children's clinics.¹ There is no choice at all in some parts of sub-Saharan Africa, where children with diabetes live, and die, as if insulin had never been discovered.

The issue is an emotive one. How could it be otherwise? But the solutions require cool consideration. The review by David Beran and John Yudkin in today's *Lancet* focuses on sub-Saharan Africa, and shows the complexity of the challenge.² People in poor countries must buy their own insulin, and its cost at the counter—often well above the price paid to the manufacturer—can become a matter of life and death. Poor countries typically lack

The prospect of a UN resolution has brought together the largest global coalition on diabetes, representing people living with the disease, their families, health-care professionals, scientists, and industry. Passage of the resolution would expand and further motivate this coalition to help bring cost-saving and highly cost-effective treatments and prevention to every corner of the world.

**Pierre Lefèbvre, Martin Silink*

International Diabetes Federation, B-1000 Brussels, Belgium
pierre@idf.org

We declare that we have no conflict of interest.

- 1 World Health Organization. Preventing chronic diseases: a vital investment. WHO global report. 2006: http://www.who.int/chp/chronic_disease_report/en (accessed Oct 23, 2006).
- 2 Venkat Narayan KM, Zhang P, Kanaya AM, et al. Diabetes: the pandemic and potential solutions. In: Jamison DT, Breman JG, Measham AR, et al, eds. *Disease control priorities in developing countries*, 2nd edn. New York: Oxford University Press, 2006: 591–604.
- 3 International Diabetes Federation. World diabetes day 2006. <http://www.worlddiabetesday.org> (accessed Nov 2, 2006).
- 4 Lobstein T, Baur L, Uauy R, for the IOTF Childhood Obesity Working Group. Obesity in children and young people: a crisis in public health. *Obes Rev* 2004; **5** (suppl 1): 4–85.
- 5 World Health Organization. Global strategy on diet, physical activity and health: obesity and overweight. 2006: <http://www.who.int/dietphysicalactivity/publications/facts/obesity/en> (accessed Oct 22, 2006).
- 6 International Diabetes Federation. *Diabetes atlas*, 3rd edn. Brussels: International Diabetes Federation, 2006.

effective health networks, distribution of insulin is often irregular, and retailers add their margin of profit or divert subsidised insulin into the more lucrative private sector. Syringes and needles must also be paid for, as must tests for glucose in the blood or urine. Not least, the health-care system must be capable of supervising the management of diabetes.

Faced with such complexity, it is all too easy for those engaged in the debate to generate good reasons for doing nothing—which may explain why the diabetes community, despite much wringing of hands, has failed to mobilise effectively to remedy the situation. The cause has, however, been actively promoted by the International Insulin Foundation, with a more slow-footed response from the International Diabetes Federation. Lars Rebien Sørensen, chief executive officer of Novo Nordisk, has taken a personal interest in the issue, and his company has pledged to make insulin available to the public sector in

50 of the world's poorest countries at no more than 20% of the average price in Europe, North America, and Japan; 33 countries have participated in the programme to date.³ All players have focused their attention on infrastructural support as well as the availability of insulin, and several pilot schemes are in place. But is this enough? As Beran and Yudkin point out, the impact of the equity-pricing initiative has been limited,² and such arrangements risk the creation of "islands of philanthropy" which distract attention from the underlying issues of patent protection and rising drug costs.⁴

People in sub-Saharan Africa are not alone in being unable to afford diabetes. A survey of elderly Americans showed that 19% of affected respondents had cut back on their use of diabetes medication in the previous year because of cost. Others had been obliged to reduce spending on items such as food, or to increase their credit-card debt.⁵ Meanwhile, the pharmaceutical business is one of the most profitable on the planet. The top five companies have a market capitalisation considerably in excess of the gross national product of India—and twice that of sub-Saharan Africa.⁴ The diabetes market has offered a bonanza for these companies in recent years, expanding from US\$3.8 billion in 1995 to \$17.8 billion in 2005, and representing annual growth of just under 20%. Much of this expansion has been driven by the introduction of more expensive branded agents. To take one example, one in five health-care dollars in the global budget is spent on a thiazolidinedione, despite lack of evidence that this class of drugs offers advantages over metformin.⁶ In the UK, it costs US\$46 to treat a patient for a year on the maximum daily dose of metformin, compared with \$710 for pioglitazone or \$980 for rosiglitazone.⁷

The world market in insulin, dominated by an oligopoly of three industrial providers, was worth \$2.0 billion in 1995, rising to \$7.3 billion in 2005, and to an expected \$11.8 billion in 2010.⁶ Novo Nordisk supplies 50% of the world's insulin, and 87% of its sales are in the USA, Europe, and Japan.³ Increased sales are partly attributed to the rising prevalence of diabetes and partly to the trend towards more intensive therapy, but largely to price escalation in relation to the analogue insulins. These costs reflect the massive investment in drug development and manufacturing plant needed to bring these insulins to the market. It is not surprising, therefore, that the companies have promoted the analogues vigorously, to the extent

The printed journal includes an image merely for illustration

that the cheaper biosynthetic human insulins have become unavailable in some markets.

No special insight is needed to forecast that drug costs for diabetes cannot continue to expand at 20% a year. Value for money is a growing concern for the richest countries, as for the poorest. The world needs cost-effective evidence-based use of drugs for diabetes, and currently lacks it—as any comparison of drug uptake in different regions will show. The diabetes community must accept its share of responsibility for this situation. It has been too ready, for instance, to accept the pretexts offered in place of blinded comparisons of the new insulins, and it is no coincidence that the most influential expert voices have tended to favour the higher-cost solutions.

Costs will, however, need to be contained, whether by rational use of evidence, by legislation (rational or otherwise), or by market forces. The burgeoning market in countries such as India and China will undoubtedly challenge the existing pricing structure and encourage new entrants into the field. Generic medications will be used more widely, and the developing world must be allowed to benefit from this change. There is increasing pressure on the US Food and Drug Administration to open the door to entry of generic human insulin into the US market.⁸ Profit margins in this area will, however, be relatively low—certainly in comparison with other biosynthetic agents—and the oligopoly, with falling marginal costs of production, can afford to mount a stiff resistance to the challenge of new rivals.

No-one should have to die of untreated diabetes. Although this disease is only one among a host of health problems that afflict the poorest countries, it is one for which effective and potentially inexpensive remedies are available. Sustainable, locally-appropriate, and cost-effective strategies are what we need, and affordable insulin is a necessary part of any solution. Philanthropic initiatives, such as that of Novo Nordisk, are immensely welcome, but equity pricing needs to extend to the private pharmacies where most patients still have to buy their insulin.² On a wider perspective, the marketing policy of the pharmaceutical industry has escalated the costs of diabetes for diminishing benefit, thereby exacerbating existing inequalities. Africa's problem is indeed our problem too.

Edwin A M Gale

Diabetes and Metabolism, Department of Clinical Science, University of Bristol, Southmead Hospital, Bristol BS10 5NB, UK
Edwin.Gale@bristol.ac.uk

I declare that I have no conflict of interest.

- 1 Pendsey S. Where are all the girls with diabetes? *Diabetes Voice* 1998; **11**: 4-5.
- 2 Beran D, Yudkin JS. Diabetes care in sub-Saharan Africa. *Lancet* 2006; **368**: 1689-95.
- 3 Novo Nordisk. novo nordisk annual report: financial, social & environmental performance 2005. 2005: http://www.novonordisk.com/images/annual_report/AR_05/Annual%20Report%2005%20UK.pdf (accessed Oct 30, 2006).
- 4 Oxfam. Patent injustice: how world trade rules threaten the health of poor people. February, 2001: http://www.oxfam.org.uk/what_we_do/issues/health/patent_injustice.htm (accessed Oct 30, 2006).
- 5 Piette JD, Heisler M, Wagner TH. Problems paying out-of-pocket medication costs among older adults with diabetes. *Diabetes Care* 2004; **27**: 384-91.
- 6 Hauber A, Gale EAM. The market in diabetes. *Diabetologia* 2006; **49**: 247-52.
- 7 British National Formulary. London: BMJ Publishing Group Limited and RPS Publishing, March, 2006.
- 8 Reuters. States petition FDA on generic insulin, hormone. Aug 4, 2006: http://today.reuters.com/news/articlenews.aspx?type=healthnews&storyID=2006-08-04T121631Z_01_MAR381259_RTRUKOC_0_US-STATES-PETITION.xml (accessed Oct 30, 2006).

Diabetes care in Africa

Infectious diseases still constitute the major contributors to mortality and morbidity in Africa. However, Africa also faces the emergence of chronic diseases, including cardiovascular diseases, diabetes, and cancers. The prevalence of diabetes will increase with improved access to highly active antiretroviral therapy, which is associated with a four-fold increase in the risk of diabetes.¹ Diabetes, thought to be rare in Africa, is now common, but many of the issues are unresolved.

A MEDLINE search last July, with the MeSH terms diabetes mellitus and Africa, yielded 0.7% of all entries on diabetes mellitus. This dearth of publications on diabetes in Africa could be due not only to insufficient local research but also to the difficulties that African investigators face in publication in peer-reviewed scientific journals. Less than 1% of continuing multicentre clinical trials on diabetes registered with the European (EudraCT) or the US (clinicaltrials.gov) databases are based in Africa; and the small number of African trials are based almost exclusively in South Africa. This lack of research and published data biases any overview of diabetes care in the African continent.

The burden of diabetes in Africa remains difficult to estimate, despite some local data. Because of the rapidly changing population structure and the profile of diabetes risk factors, the suggested 0.8-4.0% prevalence is an underestimate of the real burden of diabetes in

most African countries.² Our work shows that diabetes prevalence has increased more than ten-fold over a decade (figure). Between 1990 and 2025, the number of people with diabetes in Africa will increase by more than 180% (from 3 million to 8 million).³ This trend and data from migrant studies suggest that an epidemic is looming.⁴

Risk factors for diabetes in Africa are similar to those in other regions. But the magnitude, distribution, and trends associated with such risk factors, and their perception by the population, have not been fully studied. Diabetes is more frequent in urban than in rural areas.⁵ The contribution of each subtype of diabetes to the estimated burden of diabetes in Africa is not fully known.

Health systems in many countries in the region are geared towards the management of infectious diseases, and therefore do not have clearly defined policies for the care and management of chronic diseases such as

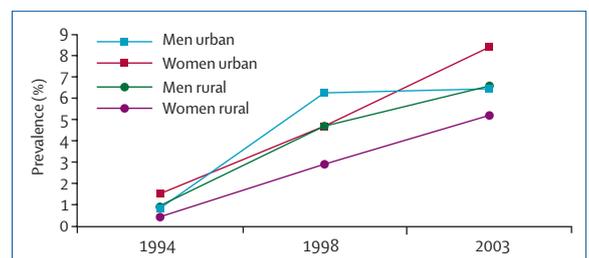


Figure: Prevalence of type 2 diabetes in Cameroon, 1994-2003
Prevalence standardised according to new world population distribution.