

As Bernard Nahlen of the Global Fund to fight AIDS, Tuberculosis and Malaria told the *Bulletin*: “In children in high-endemic areas, indirect, malaria-related mortality may be just as or even more important than the burden of acute, direct malaria-attributable mortality — but it is even more difficult to measure.”

To further clarify the picture, WHO recommends that specific, direct, acute malaria-attributable mortality also be tracked. This is done mainly through demographic surveillance sites (DSS) where disease and deaths are continuously monitored in selected populations and cause of death is ascertained by interviewing bereaved relatives.

A synthesis of available data by WHO and the US Centers for Disease Control and Prevention (CDC) published in 2005, showed that direct malaria-attributable mortality in sub-Saharan Africa among children aged under five years accounted for about 18% of all deaths in this age-group, or between 700 000 and 900 000 children.

However, even these “latest” figures refer only to 2000. With surveys and

precise longitudinal monitoring costly to implement and difficult for poor countries to sustain, it often takes a long time to collect and analyse enough data for a reliable estimate, while problems in data availability and interpretation make comparisons between subsequent estimates difficult. DSS are also typically small-scale, and extrapolation to the wider continent needs to make use of malaria risk maps.

Summing up the problem, Nahlen says that extrapolating malaria mortality rates to the wider continent is “fraught with difficulties”.

Malaria is such a nebulous disease that the chances of getting the numbers wrong are great, and this may adversely affect decision-making.

“We must have accurate mortality and case data so we can evaluate programmes and see the effects of interventions,” says Angus Spiers, UNDP’s Global Fund Malaria Advisor in Angola.

How will WHO and governments know if funding is headed to the right areas? How will they know if interventions such as insecticide-treated

mosquito nets are working? And how can they determine how much more money needs to be spent on combating the disease?

“We need reliable malaria statistics to be able to target control resources and evaluate their impact,” says Dr Allan Schapira, Coordinator in WHO’s Global Malaria Programme. “As long as the distribution of the problem is known and funding is available, the resources will be channelled to those in need, provided that the delivery systems can do the channelling. However, a gross underestimation in a particular area may cause insufficient funding of a given programme.”

No one doubts that malaria places a heavy burden on the countries that can least afford it. But to know just how big a toll the disease takes and whether the projects that are currently in place to fight it are actually working, requires more ingenuity and investment than had perhaps been anticipated, when the Roll Back Malaria movement was initiated, Schapira says. ■

Karen Iley, *Lusaka*

Mexico’s quest for a complete mortality data set

On 1 November cemeteries across Mexico are packed with the living. Death has a special place in Mexican culture, especially on the Day of the Dead — El Día de los Muertos. But while a culture that accepts death may smooth the task of collecting mortality data, poverty is a major obstacle for Mexico in its quest for a complete data set.

Mexico has been recording deaths in registers for more than 100 years, but it was not until the 1950s that the country developed a death certificate system.

“There are two moments when people die [on paper],” says Dr Rafael Lozano, General Director of Information at the Mexican Ministry of Health. “One is the certification of the death and the second is the registration. Before 1950 we only registered death without certification.”

Certification means that a doctor examines the deceased and determines the cause of death. With registry, a person was often listed as dead, but without a cause of death, Lozano says: “So we have a long history with problems of quality before 1950, and also problems of quantity.”

About 500 000 out of a population of 103 million die every year. Since

the 1980s, more than 90% of the dead have been counted due to this switch to a death certification system. In the ’50s, ’60s and ’70s mortality data was only 70% or 80% complete. In the WHO European Region coverage is about 100%, while in the WHO African Region it is less than 10%.

To help WHO’s 35 Member States in the Americas improve their mortality data, the Pan American Health Organization (PAHO) launched the Regional Core Health Data and Country Profile Initiative in 1995.

Dr Roberto Becker, Regional Advisor on Diseases Classification at PAHO in Washington, DC, explains that although most deaths are logged with a civil registry, the cause of death — recorded in the certification process — is often missing. As part of the 1995 initiative, Becker travels to the countries in PAHO’s region to teach health officials how to improve coverage in quality data.

“We don’t have 100% coverage. But we are very close,” Lozano says, citing a study published in the *Bulletin* [2005:83;171–77] that ranks Mexico among 23 countries with high quality data and 90% or more complete death registration. Venezuela was also in that group while the rest of the PAHO region had lower coverage.

Since 1950, Mexico has used the WHO-recommended death

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Dr Rafael Lozano, General Director of Information at the Mexican Ministry of Health.



A man rearranges the bones of his son in a cemetery in Yucatan Peninsula, Mexico. Families clean relatives' bones to prepare for the Day of the Dead, when Mexicans welcome the souls of the dearly departed back to earth. The celebration mixes Indian traditions and the Roman Catholic Church's All Saints' Day.

certification system to fall in line with international standards. This allowed comparison with other countries following the same protocol. Initially, another government agency did the counting. In 1985 that task was moved to Lozano's office.

Having established more accurate ways of determining the numbers and causes of death, Lozano says, the challenge today is to increase coverage.

Current efforts are focused on rural areas where poverty and inadequate infrastructure are major obstacles. "Our main problem is infant mortality," Lozano says. "We have problems with statistics ... when a child is born and when a child dies."

Counting the dead is crucial for a number of reasons.

"To count the deaths according to the cause and ages gives you an idea of what's going on with the population and how you can develop health priorities for intervention programmes to reduce deaths in those areas," says John Silvi, a statistician at PAHO. "For instance in Mexico, diabetes is an extremely important cause of death."

Lozano explains that Mexican

health officials use these data to allocate resources and to manage health-care programmes. For instance, in one programme in Mexico, a formula is used to allocate some of the funding, and mortality is one of the variables. In addition, the Ministry of Health can study the data to check for epidemics and other health problems.

Each of Mexico's 32 states, too, uses its mortality figures to set priorities for health policy, and the data are also used during Mexico's annual Health Week. "Deaths are part of the calculations that almost everybody uses," Lozano says, "and not just in the public health sector, but also in the private sector."

When someone dies, the family usually notifies health officials. A doctor will certify the death, determine the

cause and give the family the certificate. That's easy enough if the person dies in a hospital or nursing home.

"If not, it's more difficult because you have to call a private doctor," Lozano says. The doctor may charge 500 pesos, which is about US\$ 45, and most poor families can't afford that, but the Ministry of Health can't prohibit doctors from charging. "It's a problem for rural areas or very poor families," Lozano says.

Next the family calls the funeral parlour, which fetches the body, and that starts the process of administrative registry. A relative must then go to the office of civil

registration and exchange the certificate for the "acta de defunción." The acta is the only one of the two that is legally valid.

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The certificate, meanwhile, goes to the Ministry of Health. One copy goes to Mexico's National Institute of Statistics and Geographical Information (INEGI) and the other stays in the civil registry office. The Ministry of Health's forms are coded monthly by doctors assigned for just that purpose according to International Classification of Disease rules, and for its part, INEGI compiles monthly statistics.

Later on, Ministry of Health officials classify the data by cause of death and other factors, Lozano says.

Two types of families don't report: those who can not afford to call a doctor

and those who live too far away from an administrative centre.

"This lack of reporting is most frequent in a rural environment," says Lozano, adding that the Ministry of Health can not force people by law to report.

Mexico's Ministry of Health has tried to educate people in hospitals and other facilities in some parts of the country about the need to report every death. Lozano says that the non-reporters represent a small number of people and that, overall, figures are accurate.

Mexico's mortality data has, among other things, helped to highlight the gaping disparities between poor and

affluent in this middle-income country.

Although average life expectancy in Mexico is 75 years for men and 77 for women, there is a wide range of disparity between rich and poor. For adults the main causes of death tend to be chronic diseases, such as diabetes, heart disease and stroke. For children pneumonia is still a leading cause of death, while perinatal problems are a big killer of newborns.

"The problem ... is the gaps within the country," Lozano says. "The difference [in life expectancy] between the poorest and the richest states in Mexico is something like 11 years." ■

Theresa Braine, *Mexico City*

Counting the dead in China

In China, home to 1.3 billion people, or one-fifth of the world's population, complete registration and medical certification of every single death is, at present, logistically and financially unattainable. As part of a major revamp of its health information system, China is merging two systems for collecting mortality data to gain a more accurate picture of how many people die and why.

Cause-of-death data are playing an increasingly important role in the public health policy of China.

"When we have this kind of information, we can see how patterns have changed," says Dr Wu Fan, Director of the National Center for Chronic and Noncommunicable Disease Control and Prevention, China's Center for Disease Control and Prevention (CDC). Recently, CDC took part in a research

project led by the Center for Statistics of the Ministry of Health on the disease burden and long-term health problems in China; the results were dramatic.

"Now we know that infectious diseases are lower, and noncommunicable diseases are greater, and that in rural areas injuries are increasing. We can know which population has major problems and so we can target them, and we can know which diseases will have a long-term impact. This helps us to understand what our priorities should be."

Cause-of-death data have led to a better understanding of changing disease patterns in China, but public health officials are still forced to hazard a guess at disease patterns in the less-developed west, where mortality data are scant to non-existent.

China has two systems to count deaths: the Ministry of Health (MOH) vital registration system and

the disease surveillance point (DSP) system, which is monitored by the country's CDC.

In 2003, there was a growing concern that the DSP system was not reflecting the true situation across the whole country. "The problem with the DSP system is that currently it's not completely representative of China," says Dr Wu. "They [disease surveillance points] tend to be in developed areas and cities along the more prosperous east coast, and less in the rural areas in the less-developed west."

Furthermore, at that time the DSP system was being used only in

areas with a population range of 20 000 to 100 000, and nationwide covered just 1% of the population. "That was a very obvious weakness," Dr Wu says, adding that because of the small sample base, the numbers for rare diseases were not stable, and changed every year.

Since it was launched in 1989, the DSP system has reported on causes of death through a mix of verbal autopsy and medical certification. Many indicators were not reliable, and the

system needed to be readjusted.

Over the last two years, adjustments have been made to the DSP system. The number of sample sites has risen

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Yang Yankang

Two boys stand in front of their grandfather's coffin in Sanyuan county, Shaanxi Province in 1998. The boys are wearing gifts given to them by family members who have come to attend the funeral, a local custom. A hooded mourner is dressed in white, the colour of mourning in China. People in cities are usually cremated, but rural residents prefer to be buried.