

## FOR THE RECORD

**WHO proposes framework for handling pandemics**

**W**orld Health Organization (WHO) member states will be obliged to share influenza samples with human pandemic potential under a new framework aimed at achieving a more coherent global response to pandemics.

Under the framework, member states must make flu samples readily available to WHO-affiliated national laboratories and surveillance centres ([www.who.int/csr/disease/influenza/pip\\_framework\\_16\\_april\\_2011.pdf](http://www.who.int/csr/disease/influenza/pip_framework_16_april_2011.pdf)). In exchange, developing countries, which lack the capacity to manufacture vaccines, diagnostics and pharmaceuticals will be provided greater access to such materials when they are developed in other nations.

Samples to be shared do not include seasonal flu but rather “human clinical specimens, virus isolates of wild type human H5N1 and other influenza viruses with human pandemic potential; and modified viruses prepared from H5N1 and/or other influenza viruses with human pandemic potential developed by WHO GISRS [global influenza surveillance and response system] laboratories, these being candidate vaccine viruses generated by reverse genetics and/or high growth re-assortment,” along with “RNA extracted from wild-type H5N1 and other human influenza viruses with human pandemic potential and cDNA that encompass the entire coding region of one or more viral genes.”

“The framework provides a much more coherent and unified global approach for ensuring that influenza viruses are available to the WHO system for monitoring and development of critical benefits such as vaccines, antiviral drugs and scientific information while, at the same time, ensuring more equitable access to these benefits by devel-

oping countries,” Dr. Keiji Fukuda, WHO’s assistant director-general of Health Security and Environment, said in a news release ([www.who.int/media\\_centre/news/releases/2011/pandemic\\_influenza\\_prep\\_20110417/en/index.html](http://www.who.int/media_centre/news/releases/2011/pandemic_influenza_prep_20110417/en/index.html)).

The framework, which was crafted by a working group cochaired by Ambassador Juan José Gomez-Camacho (Mexico) and Ambassador Bente Angell-Hansen (Norway), must still be approved by member states.

It’s hoped the new framework will ultimately make vaccines and antiviral drugs more available in developing countries, which typically do not have the resources to routinely monitor the spread of influenza, or the industrial capacity to develop vaccines.

Under the framework, flu samples forwarded to WHO facilities will be analyzed to determine virus structure. It’s expected that information will either be shared with industry in reports or that the ensuing genetic sequence data will be placed in public-domain or public-access databases, which similarly, should result in more rapid production of vaccines, diagnostics and pharmaceuticals.

Companies that use the information generated by the WHO’s laboratories will be expected to fund roughly half the cost of WHO surveillance and monitoring expenses, through an “annual partnership contribution,” commencing in 2012. “It is decided that the sum of the annual contributions shall be equivalent to 50% of the running costs of the WHO GISRS,” the framework states. “The distribution between companies is to be based on transparency and equity, based on their nature and capacities. The Director-General in consultation with the ‘Advisory Group’ will further define the specific amounts to be contributed by each company as well as the mechanism for implementation.”

Officials also believe the sharing of resources should ultimately increase the global production of vaccines and

antiviral drugs, thus making them more affordable. The framework urges member states to encourage manufacturers to negotiate lower rates for antiviral drugs and vaccines in lower-income countries.

The framework “reflects also a unique partnership with industry, and contains concrete measures of cooperation with both industry and civil society,” Angell-Hansen said in the news release. — Samia Madwar, Ottawa, Ont.

**Noncommunicable disease toll**

**C**hronic conditions, such as heart disease, cancers, respiratory diseases and diabetes, kill more people worldwide than all other diseases combined and could claim as many as 52 million lives annually by 2030, according to a landmark report released Wednesday by the World Health Organization (WHO).

Some 36 million or 63% of all global deaths in 2008 were due to chronic diseases, many of which are preventable, according to WHO’s *Global status report on noncommunicable diseases, 2010* ([www.who.int/nmh/publications/ncd\\_report\\_full\\_en.pdf](http://www.who.int/nmh/publications/ncd_report_full_en.pdf)). Moreover, the vast majority of these deaths occurred in low- and middle-income countries, dispelling the myth that such conditions are mainly a problem of wealthy nations.

“For some countries, it is no exaggeration to describe the situation as an impending disaster; a disaster for health, for society, and most of all for national economies,” Dr. Margaret Chan, WHO director-general, said in a news release ([www.who.int/mediacentre/news/releases/2011/ncds\\_20110427/en/index.html](http://www.who.int/mediacentre/news/releases/2011/ncds_20110427/en/index.html)). “Chronic noncommunicable diseases deliver a two-punch blow to development. They cause billions of dollars in losses of national income,

and they push millions of people below the poverty line, each and every year.”

But the report argues millions of deaths can be prevented if governments implement stronger controls on tobacco and alcohol, and do more to promote healthy diets and physical activity, in addition to improving their peoples' access to essential health care.

Tobacco use alone kills almost six million people a year, and is estimated by the WHO to cause about 71% of lung cancers, 42% of chronic respiratory disease and nearly 10% of cardiovascular disease.

The report lists smoking bans, tax hikes on tobacco and alcohol, restricting access to retail alcohol, reducing salt and trans fats in national food supplies, and raising awareness about diet and physical activity among the “best buy” interventions that governments should immediately undertake to reduce the global burden of chronic disease.

The WHO estimates such interventions have the potential to prevent around three-quarters of heart disease, stroke and type 2 diabetes, as well as about 40% of cancers.

Other cost-effective interventions recommended by the report include providing nicotine-dependence treatment, restrictions on marketing food and beverages high in salt, fats and sugar, and food taxes and subsidies to promote healthy diets. — Lauren Vogel, *CMAJ*

### “Startling discrepancies” in funding for top killer cancers

Canadians need to make charitable donation decisions with their heads, as well as their hearts, argues a report that uncovers “gaping holes” in funding for four of the deadliest cancers.

Pancreatic, stomach, lung and colorectal cancers collectively cause nearly half of all deaths, but receive only 15% of all public and private research funding, and just 1.6% of all donations made to charitable groups, nonprofit sector watchdog Charity Intelligence Canada reports in *Cancer in Canada: Framing the Crisis and Previewing the Opportunity for Donors* ([www.charityintelligence.ca](http://www.charityintelligence.ca)

[/pdfs/download.php?report=Ci\\_Cancer\\_Report\\_April\\_2011.pdf](http://pdfs/download.php?report=Ci_Cancer_Report_April_2011.pdf)).

Despite having the lowest five-year survival rate, the four cancers combined receive only \$63 in research funding and less than \$5 in charity funding for every potential year of life they claim. In comparison, breast cancer receives \$575 in research funding and \$691 in charity funding per life year lost to the disease, or a “staggering” 151 times the total funding.

“Breast cancer is a success story. Thanks to lifesaving advances in prevention, screening and treatment 89% of breast cancer patients survive the disease,” Karen Greve Young, coauthor of the report, said in a news release ([www.charityintelligence.ca/?news=21](http://www.charityintelligence.ca/?news=21)). “Pancreatic, stomach, lung and colorectal cancer need a success story.”

Citing Canadian Cancer Research Alliance data, the report says “Canada’s cancer research budget is approximately evenly split between general cancer research and research attributed to specific cancer types. Of research allocated to specific cancer types, 28% is dedicated to breast cancer research, 12% to leukemia, 9% to prostate, 8% to brain, and 7% each to lung and colorectal.”

The report notes that efforts to rectify the discrepancies in research investment for types of cancer, relative to the toll taken, are expected to be implemented as part of the ongoing Canadian Partnership Against Cancer, to which the federal government has contributed \$500 million, to better coordinate cancer control, research and treatment initiatives.

But charitable donors can help “change the landscape of cancer: supporting underfunded cancers, resolving gaps in research and development funding, and implementing research findings for Canadians along the cancer patient life cycle of prevention, screening and diagnosis, treatment, and care.”

Part of the problem has been that donor heart and purse strings are often entwined, the report indicates. It argues that the 27% of cancer-specific charity funding that goes to children’s cancer, for example, far surpasses any quantifiable measure of the impact of cancer on children. Less than 1% of all cancers occur in children; “however, the poignancy of child cancer patients

compels people to donate significantly to children’s cancer charities.”

Because of their high mortality rates, pancreatic, stomach, lung and colorectal cancers also lack survivors to tell their stories and rally support. With its high incidence and low survival rate, for example, lung cancer causes almost one-third of all Canadian cancer deaths.

The report calls on Canadians to reallocate their charitable donations to those cancers that take the most years of life from Canadians.

It also suggests Canadians could get more bang for their bucks by giving to cancer research institutions directly, rather than donating to charities that in turn make research grants to institutions. About 32 cents of every dollar spent by the largest charities in 2009 went to administrative and fundraising costs, the report states, a little more than total spending on grants for research programs. The report estimates donors have the opportunity to increase the impact of their research contributions by 47% by simply cutting out the middle man.

The report also argues that charities “entice donors with the elusive promise of a cure,” diverting potential funding from areas, such as palliative care, where investment could “immediately improve the remaining lives of patients and relieve the burden on care givers and the health care system.” Of the 76 200 cancer patients who died in hospital in 2010, the report estimates some 38 100 people could have been transferred to hospice for a total savings of \$1.14 billion.

Canadians have an average lifetime risk of developing cancer of 40%–45%. — Lauren Vogel, *CMAJ*

### Consumption of federally regulated foods causes half of foodborne disease burden

One in six Americans get sick from eating tainted food every year, and about half of those cases result from the consumption of regulated foods, according to a report from the University of Florida’s Emerging Pathogens Institute.

The report, *Ranking the Risk: The 10 Pathogen-Food Combinations with*

*the Greatest Burden on Public Health*, found that 10 such combinations alone annually result in 765 deaths, nearly 30 000 hospitalizations, roughly 3.8 million illnesses (including diarrhea, organ failure, paralysis, neurological impairment and blindness), the loss of about 37 000 “quality adjusted life years” and a projected \$US8.1 billion in treatment costs and productivity losses.

The top 10 culprits?

1. Campylobacter — Poultry
2. Toxoplasma — Pork
3. Listeria — Deli Meats
4. Salmonella — Poultry
5. Listeria — Dairy products
6. Salmonella — Complex foods
7. Norovirus — Complex foods
8. Salmonella — Produce
9. Toxoplasma — Beef
10. Salmonella — Eggs.

The report found that five foodborne pathogens — salmonella, campylobacter, listeria, toxoplasma and norovirus — accounted for more than 90% of the overall \$US14 billion public health burden ([www.epi.ufl.edu/sites/www.epi.ufl.edu/files/RankingTheRisksREPORT.pdf](http://www.epi.ufl.edu/sites/www.epi.ufl.edu/files/RankingTheRisksREPORT.pdf)).

Salmonella causes the greatest health burden and “is one of the few foodborne pathogens that has not significantly declined over the past 10 years,” the report notes, adding that Centers for Disease Control and Prevention (CDC) projections indicate that this pathogen alone results in \$US3.3 billion in costs and the loss of 17 000 quality adjusted life years.

The report adds that salmonella is associated with a wide variety of foods regulated by the US Food and Drug Administration (FDA) and the US Food Safety and Inspection Service. “This suggests that reduction of the national burden of salmonellosis will require a coordinated effort by both agencies addressing a broad array of foods. We recommend the agencies convene a national cross-agency initiative in collaboration with CDC that looks across the entire food system to target opportunities for risk reduction.”

Contaminated poultry had the greatest health impact, accounting for \$US2.5 billion in costs and the loss of 15 000 quality adjusted life years. That

was followed (in descending order) by: complex foods, pork, produce, beef, deli/other meats, dairy products, seafood, game, eggs, baked goods and beverages.

The report estimates about half of the overall burden of foodborne disease is caused by the consumption of FDA-regulated foods. It faults insufficient oversight, particularly when it comes to food handling and preparation problems in food service, retail and restaurant settings.

Federal agencies have no direct oversight of most of the places in which food is prepared and sold to consumers, the report states. But federal actions “that could improve retail and food service food safety include fully funding state and local inspection activities, increasing adoption of the most recent food code, improving education and training of food workers and government inspectors, and creating incentives to foster improved food safety in the private sector.”

The report also questions whether new safety standards announced by the US Department of Agriculture (USDA) for poultry are sufficient, and recommends evaluating and tightening these strictures over time.

Last year, Congress passed the Food Safety Modernization Act, which broadly directed the FDA to adopt a more preventive, risk-based approach, but failed to spell out how that should be done ([www.epi.ufl.edu/?q=RankingTheRisks](http://www.epi.ufl.edu/?q=RankingTheRisks)).

Among other remedies, the report calls on federal, state and local agencies to coordinate to improve “food attribution” data for top-ranked pathogens, as well as requirements that toxoplasmosis be made a nationally notifiable disease. — Lauren Vogel, *CMAJ*

## Multiple factors caused cholera outbreak in Haiti

A “confluence of circumstances,” rather than the deliberate actions of an individual or group, caused the recent cholera outbreak in Haiti which has killed over 4500 people and sickened nearly 300 000 others, a United

Nations expert panel has concluded.

But whatever the vector, there is no doubt that the outbreak was caused by a “pathogenic strain of the current South Asian type *Vibrio cholerae*,” according to the *Final Report of the Independent Panel of Experts on the Cholera Outbreak in Haiti* ([www.un.org/News/dh/in-focus/haiti/UN-cholera-report-final.pdf](http://www.un.org/News/dh/in-focus/haiti/UN-cholera-report-final.pdf)).

The panel said that the evidence indicates the strain spread from the mountainous area around Mirebalais (the town where the outbreak was first identified) and subsequently contaminated the Artibonite River, moving downstream throughout all of Haiti.

“This explosive spread was due to several factors, including the widespread use of river water for washing, bathing, drinking, and recreation; regular exposure of agricultural workers to irrigation water from the Artibonite River; the salinity gradient in the Artibonite River Delta, which provided optimal environmental conditions for rapid proliferation of *Vibrio cholerae*; the lack of immunity of the Haitian population to cholera; the poor water and sanitation conditions in Haiti; the migration of infected individuals to home communities and treatment centers; the fact that the South Asian type *Vibrio cholerae* strain that caused the outbreak causes a more severe diarrhea due to the larger production of the more potent classical type of cholera toxin; and, the conditions in which cholera patients were initially treated in medical facilities did not prevent the spread of the disease to other patients or to the health workers,” the report states.

“The introduction of this cholera strain as a result of environmental contamination with feces could not have been the source of such an outbreak without simultaneous water and sanitation and health care system deficiencies. These deficiencies, coupled with conducive environmental and epidemiological conditions, allowed the spread of the *Vibrio cholerae* organism in the environment, from which a large number of people became infected.”

Yet, while the expert panel rejected the widely-held belief within Haiti that the cholera outbreak was caused by a team of UN aid workers, it did note that

the outbreak “highlights the risk of transmitting cholera during mobilization of population for emergency response.”

“All United Nations personnel and emergency responders traveling to emergencies should receive prophylactic antibiotics, be immunized against cholera with currently available oral vaccines, or both, in order to protect their own health and to protect the health of others,” the report recommends.

It also urges that UN installations properly “treat fecal waste using on-site systems that inactivate pathogens before disposal,” using trained and qualified UN staff.

Other recommendations included:

- “To prevent the spread of cholera, the United Nations and the Government of Haiti should prioritize investment in piped, treated drinking water supplies and improved sanitation throughout Haiti. Until such time as water supply and sanitation infrastructure is established: Programs to treat water at the household or community level with chlorine or other effective systems, handwashing with soap, and safe disposal of fecal waste should be developed and/or expanded; and safe drinking water supplies should continue to be delivered and fecal waste should be collected and safely disposed of in areas of high population density, such as the spontaneous settlement camps.
- The international community should investigate the potential for using vaccines reactively after the onset of an outbreak to reduce cholera case-load and spread of the disease.
- Recent advances in molecular microbial techniques contributed significantly to the investigative capabilities of this report. Through its agencies, the United Nations should promote the use of molecular microbial techniques to improve surveillance, detection, and tracking of *Vibrio cholerae*, as well as other disease-causing organisms that have the potential to spread internationally.”

— Wayne Kondro, *CMAJ*

## Alberta restructures health care system management

Scant years after moving to centralized oversight of its health care system, Alberta has signalled a partial retreat by announcing that it will transfer some decision-making authority to its five health zones.

Each zone will now have an operational leader and a zone medical director to facilitate more community consultation, and allow operational decisions to be made closer to where the care is being provided, under a “realignment of the organization’s leadership structure” announced by Alberta Health Services ([www.albertahealthservices.ca/4623.asp](http://www.albertahealthservices.ca/4623.asp)).

The restructuring will also see the creation of a chief operating officer (COO) position to oversee acute and community care operations in all five health zones ([www.albertahealthservices.ca/rls/ne-rls-2011-05-03-backgrounder.pdf](http://www.albertahealthservices.ca/rls/ne-rls-2011-05-03-backgrounder.pdf)). As well, the role of the chief medical officer (CMO) will be expanded to include responsibility for patient relations, “patient-care pathways” and oversight of the multidisciplinary groups, known as Clinical Networks, that were created to give clinicians, medical professionals and patients more opportunity to recommend measures related to clinical services planning and practice improvement ([www.albertahealthservices.ca/hp/if-hp-clin-network-tor.pdf](http://www.albertahealthservices.ca/hp/if-hp-clin-network-tor.pdf)).

Alberta Health Services argued that the new management regime will result in “a stronger, more independent role for the zones, with one operational leader for each zone, and a zone medical director sharing responsibility for each zone. This will in turn mean clearer roles, responsibilities and accountabilities for all leaders and fewer committee-based decisions.”

The department also said that success will hinge on collaborative decision-making between the CMO and COO. “Essentially, clinical and operating decisions become two parts of a whole. The COO and CMO will work closely on all major decisions. Similarly, zone leaders will work in close partnership with the zone Medical Directors. The principle will apply to all working relationships in acute and continuing care as well. Across the system, decision-making becomes a partnership between clinical and operational leaders.”

The new arrangement should also provide physicians with a greater opportunity to influence decisions, Dr. Chris Eagle, president and CEO of Alberta Health Services, said in the news release. “Physicians and other clinical leaders want and need to be part of planning and decision-making from beginning to end. Changing the way we are structured in order to engage them is the key first step. In turn, this will help us accelerate our performance improvement objectives, including wait-time reductions in high priority areas such as cancer care and community care.”

In a letter to staff, Eagle stressed that changes will not disrupt services to patients ([www.albertahealthservices.ca/org/ahs-org-tt-ceo-message-for-staff.pdf](http://www.albertahealthservices.ca/org/ahs-org-tt-ceo-message-for-staff.pdf)).

The announcement comes roughly three years after Alberta consolidated power previously held by regional boards into a single entity responsible for all health care decisions ([www.cmaj.ca/cgi/doi/10.1503/cmaj.109-3165](http://www.cmaj.ca/cgi/doi/10.1503/cmaj.109-3165)).

The structural changes at the executive level are expected to be completed by the end of May, while the more operational changes at the health zone level will be made within three to nine months.

— Erin Walkinshaw, Ottawa, Ont.

## Better health care for less money

More money should not be pumped into Canadian hospitals, or the Canadian health care system as a whole, until effectiveness and efficiency benchmarks are developed and begin to be utilized, argues a report from the Certified General Accountants Association of Canada.

“Block funding (or a lack of activity-based or patient-based funding) has historically limited hospitals’ ability to assess their own effectiveness and efficiency. Furthermore, the lack of benchmarks for effectiveness and efficiency in the quantity and quality of health care provided has limited the scope of incentives. Incentive alignment or pay-for-performance can only be implemented if performance on access, quality, outcomes and cost dimensions can be readily mea-

sured in a consistent manner over time and in a uniform way across hospitals,” concludes the report, *Can We Get Better for Less: Value for Money in Canadian Health Care* ([www.cga-canada.org/en-ca/ResearchReports/ca\\_rep\\_2011-04\\_healthcare.pdf](http://www.cga-canada.org/en-ca/ResearchReports/ca_rep_2011-04_healthcare.pdf)).

“It is not sufficient to be satisfied with increasing health care outcomes if such outcomes are largely supply-driven. The combination of physician autonomy, lack of integrated care and information asymmetry between front line clinicians and financial managers in hospitals make it difficult to detect whether provision of health care services is demand-based or supply-based. Hospitalization rates inadvertently reflect hospital bed supply, with research showing that admission rates are positively correlated with the capacity of acute care beds. Similarly, clinicians may inadvertently make referrals for high-cost, technology-based diagnostic services often because such diagnostics are readily available. While supply based care can yield higher health benefits with increased health care spending, these benefits may be largely avoidable care. In such cases, higher spending on health care is likely to be associated with more but not necessarily better care,” the report adds.

The report notes that while Canada consistently ranks poorly in international comparisons of value-for-money spent on health care, the adoption and use of standardized benchmarks for effectiveness and efficiency in health care has “not gained commensurate traction.”

The report argues that the justification for adopting a “value-for-money” approach includes:

- “A lack of activity-based or patient-based funding historically may have limited hospitals’ ability to assess their own effectiveness and efficiency. Block funding may not present hospital management with persuasive incentive to reduce costs (inputs) or improve value (output) in terms of timely access to care, patient health outcomes and other dimensions of quality and quantity of health care.
- A focus on outcome measures alone may not be sufficient to assess and evaluate management for the stewardship of resources allocated to them.

Per-capita spending seems largely unrelated to outcomes since higher spending on health care services may not always offer overall benefits. One reason for the lack of sufficient correlation between spending and health outcomes is that health care resourcing can often be supply-driven.

- Outcome measures may not reflect how much value-for-money results from health care spending. Detecting economic efficiency or sound stewardship of economic resources requires performance metrics that capture output per unit of input (or input per unit of output). Increasing use of pay-for-performance models in hospitals highlights the importance of identifying appropriate metrics on which to reward hospital management.
- A number of reasons exist for the slow integration of value measures in health care delivery. Among these are the difficulties in measuring quality and thus value; wide range of severity and complexity of illnesses and thus possible outcomes; non-aligned responsibilities and divergent skill sets among the financial managers and clinicians.
- Introducing incentives for improving quality of health care is not sufficient to improve efficiency of health care delivery. Incentives such as pay-for-performance systems, benchmarking for quality and value, and hospital funding based on volume of care will likely influence what gets measured, and therefore managed.”

“Value measures can offer the possibility of greater decision-making autonomy and flexibility for hospital management and can result in improved resource allocation, planning, and decision making while ensuring that hospital actions are in accordance with the broader social and economic objectives of governments and taxpayers,” the report adds. — Wayne Kondro, *CMAJ*

## Geographic distribution of disease burden is changing

The notion that noncommunicable diseases are the burden of wealthy industrialized nations, while infectious diseases are the

scourge of undeveloped nations, has become a myth as the evidence indicates that all countries now face the burden of both types of disease, the World Health Organization (WHO) says in its annual report on health.

Noncommunicable diseases such as heart disease, stroke, diabetes and cancer are now responsible for up to two-thirds of all deaths globally, as a consequence of population aging and the spread of risk factors associated with globalization and urbanization, the WHO says in its report, *World Health Statistics 2011* ([www.who.int/whosis/whostat/EN\\_WHS2011\\_Full.pdf](http://www.who.int/whosis/whostat/EN_WHS2011_Full.pdf)).

As a result, countries can no longer focus their health systems on one disease perspective or the other, Ties Boerma, Director of WHO’s Department of Health Statistics and Informatics, stated in a news release ([www.who.int/mediacentre/news/releases/2011/health\\_statistics\\_20110513/en/index.html](http://www.who.int/mediacentre/news/releases/2011/health_statistics_20110513/en/index.html)). “Everyone must develop a health system that addresses the full range of the health threats in both areas.”

The annual report on more than 100 health indicators among the WHO’s 193 member states indicates that life expectancy in 2009 was 68 years and that the discrepancy in health spending between low- and high-income countries remains substantial. “In low-income countries, per capita, health expenditure is an estimated US\$ 32 (or about 5.4% of gross domestic product) and in high-income countries it is US\$ 4590 (or about 11% of gross domestic product). High-income countries have, per capita, on average 10 times more doctors, 12 times more nurses and midwives and 30 times more dentists than low-income countries. Virtually all deliveries of babies in high-income countries are attended by skilled health personnel; but this is the case for only 40% of deliveries in low-income countries.”

The report also indicates that progress towards achievement of health-related Millennium Development Goals varies significantly by nation. Among the findings:

- An estimated 115 million children under the age of five are underweight. “In Africa, the stagnation of prevalence coupled with population growth led to an increase in the num-

- ber of underweight children — from 24 million in 1990 to 30 million in 2010. In Asia, the number of underweight children was estimated to be even larger at around 71 million in 2010. About 178 million children globally are too short for their age group (stunted) compared to the WHO child growth standards, with such stunting being a key indicator of chronic malnutrition. As growth slows down, brain development lags behind and as a result stunted children are more likely to learn poorly. Stunting rates among children are highest in Africa and Asia.
- The mortality rate for children under the age of five continues to decline to 60 per 1000 live births in 2009 from 89 per 1000 in 1990. But that level “remained alarmingly high in certain regions of the world. In 2009, the levels of mortality in children under five years old in the WHO African Region (127 per 1000 live births) and in low-income countries (117 per 1000 live births) were still higher than the 1990 global level of 89 per 1000 live births.” Pneumonia (18%) and diarrhoeal diseases (15%) were the two biggest killers of children under age five in 2008.
  - Global measles immunization coverage was 82% among children aged 12–23 months by 2009, as compared with 73% in 1990.
  - The number of women dying as a result of complications during pregnancy decreased to 358 000 in 2008 from 546 000 in 1990 but “the annual rate of decline of 2.3% is less than half of the 5.5% needed to achieve the target of reducing the maternal mortality ratio by three quarters between 1990 and 2015. Almost all maternal deaths (99%) in 2008 occurred in developing countries.”
  - The estimated number of deaths from malaria decreased to 781 000 in 2009 from 1 million in 2000.
  - The annual global number of new cases of tuberculosis continues to increase slightly as slow reductions in incidence rates per capita are offset by population increases. In 2009, prevalence was estimated at 12–16 million cases, with an estimated 9.4 million new cases. An estimated 1.3 million HIV-negative people died from tuberculosis in 2009.”
  - The number of people living with HIV rose to 33.3 million in 2009, in which there were an estimated 2.6 million new infections and 1.8 million HIV/AIDS-related deaths. “However, the overall growth of the global epidemic appears to have stabilized, with the annual number of estimated new HIV infections steadily declining. In 2009, the estimated number of new HIV infections was 19% lower than in 1999.
- The increasing number of people living with HIV reflects in part the life-prolonging effects of antiretroviral therapy.”
- “Neglected tropical diseases affect more than 1000 million people, primarily in poor populations living in tropical and subtropical climates. Since 1985, the reported prevalence of leprosy has been reduced by more than 90%, and more than 15 million patients have been cured. In 2009, lymphatic filariasis was endemic in 81 countries. Of these countries, 53 were implementing mass treatment programmes — with the number of people treated increasing from 10 million in 2000 to 546 million in 2007. Between 1989 and 2009, the number of new cases of dracunculiasis fell from an estimated 892 055 in 12 disease-endemic countries to 3190 reported cases in four countries — a decrease of more than 99%. Outbreaks of dengue, however, are increasing and spreading geographically, with cases being reported in five of the six WHO regions.”
  - “The percentage of the world’s population with access to improved drinking-water sources increased from 77% to 87% between 1990 and 2008.” — Wayne Kondro, *CMAJ*

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