WHO ESTIMATES OF THE GLOBAL BURDEN OF FOODBORNE DISEASES

EXECUTIVE SUMMARY

Foodborne diseases are an important cause of morbidity and mortality, and a significant impediment to socio-economic development worldwide, but the full extent and burden of unsafe food, and especially the burden arising from chemical and parasitic contaminants, has been unknown. Precise information on the burden of foodborne diseases can adequately inform policy-makers and to allocate appropriate resources for food safety control and intervention efforts.

This report, resulting from the WHO Initiative to Estimate the Global Burden of Foodborne Diseases and prepared by the WHO Foodborne Disease Burden Epidemiology Reference Group (FERG), provides the first estimates of global foodborne disease incidence, mortality, and disease burden in terms of Disability Adjusted Life Years (DALYs).

For the global estimates, thirty-one foodborne hazards causing 32 diseases are included, being 11 diarrhoeal disease agents (1 virus, 7 bacteria, 3 protozoa), 7 invasive infectious disease agents (1 virus, 5 bacteria, 1 protozoan), 10 helminths and 3 chemicals.
Together, the 31 hazards caused 600 (95% uncertainty interval [UI] 420–960) million foodborne illnesses and 420,000 (95% UI 310,000–600,000) deaths in 2010.

The most frequent causes of foodborne illness were diarrhoeal disease agents, particularly norovirus and *Campylobacter* spp. Foodborne diarrhoeal disease agents caused 230,000 (95% UI 160,000–320,000) deaths, particularly non-typhoidal *Salmonella enterica* (NTS) which causes diarrhoeal and invasive disease.

Other major causes of foodborne deaths were *Salmonella* Typhi, *Taenia solium*, hepatitis A virus, and aflatoxin. The global burden of foodborne disease by these 31 hazards was 33 (95% UI 25–46) million DALYs in 2010; 40% of the foodborne disease burden was among children under five years of age.

Worldwide, 18 (95% UI 12–25) million DALYs were attributed to foodborne diarrhoeal disease agents, particularly NTS and enteropathogenic *Escherichia coli* (EPEC). Other foodborne hazards with a substantial contribution to the global burden included *Salmonella* Typhi and *Taenia solium*.

Foodborne burden estimates are also reported for a further 3 bacterial and 1 chemical hazards, but only for some subregions; a global estimate was not feasible.

World Health Organization

There were considerable differences in the burden of foodborne disease among subregions delimited on the basis of child and adult mortality. The highest burden per population was observed in Africa (AFR) (AFR D and AFR E subregions), followed by South-East Asia (SEAR) (SEAR B and SEAR D subregions) and Eastern Mediterranean (EMR) D subregion.

Diarrhoeal disease agents were the leading cause of foodborne disease burden in most subregions. NTS was an important burden in all subregions, particularly in Africa. Other main diarrhoeal causes of foodborne disease burden were EPEC, enterotoxigenic *E. coli* (ETEC) and *Vibrio cholerae* in low-income subregions, and *Campylobacter* spp. in high-income subregions. The burden of aflatoxin was high in the AFR D, Western Pacific (WPR) B and SEAR D subregions.

In the SEAR subregions there was a considerable burden of *Salmonella* Typhi. The burden of *Opisthorchis* spp. was concentrated in the SEAR B subregion, where the seafood-borne trematodes *Paragonimus* spp. and *Clonorchis sinensis* were also important.

In the Americas (AMR) B and D subregions, *Taenia solium* and *Toxoplasma gondii* contributed significantly to the foodborne disease burden. The global burden of foodborne diseases is considerable, with marked regional variations.

The burden of foodborne diseases is borne by individuals of all ages, but particularly by children under 5 years of age, and by persons living in low-income subregions of the world.

These estimates are conservative; further studies are needed to address the data gaps and limitations of this study.

In addition to providing global and regional estimates, the Initiative sought to promote actions at a national level. This involved capacity building through national foodborne disease burden studies, and encouraging the use of burden information in setting evidence-informed policies.

A suite of tools and resources were created to facilitate national studies of the foodborne burden of disease, and pilot studies were conducted in four countries (Albania, Japan, Thailand and Uganda). Data gaps were the major hurdle in estimating the foodborne disease burden in these national studies, and the global and regional estimates provided by FERG offer an interim solution, until improved surveillance and laboratory capacity is developed.

Despite the data gaps and limitations of these initial estimates, it is apparent that the global burden of foodborne disease is considerable, and affects individuals of all ages, but particularly children under 5 years of age and persons living in low-income subregions of the world.

All stakeholders can contribute to improvements in food safety throughout the food chain by incorporating these estimates into policy development at national, regional and international levels.

For more information on the WHO Estimates of the Global Burden of Foodborne Diseases, please visit:
http://www.who.int/foodsafety/areas_work/foodborne-diseases/ferg/en/

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