

The Global Epidemiology of Meningococcal Disease

- Meningococcal disease is a sudden, aggressive illness that can lead to death within 24-48 hours of the first symptoms
- One in five people who survive meningococcal disease will suffer life-long devastating complications, such as brain damage, learning disabilities, hearing loss and limb loss
- Infants are at greatest risk for contracting meningococcal disease, representing the greatest unmet need for protection

Meningococcal Disease: geographic diversity and shifting serogroups

Meningococcal disease is a sudden, life-threatening illness that manifests as bacterial meningitis – an infection of the membrane around the brain and spine – and sepsis – a bloodstream infection.^{1,2,3,4} According to the World Health Organization (WHO), approximately 5-10 percent of people who contract meningococcal disease will die – often within 24-48 hours of the first symptoms – even if they are diagnosed and receive early and appropriate treatment.⁶ Without treatment, the mortality rate from meningococcal disease is 70 percent – 90 percent.⁷

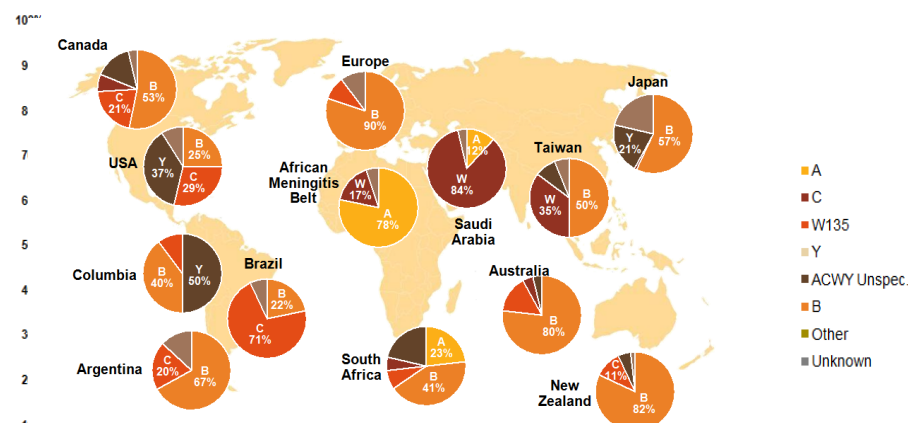
Each year, approximately 500,000 cases of meningococcal disease occur around the world, causing about 50,000 deaths.⁵

The majority of all meningococcal disease cases around the world can be attributed to five main groups of the bacteria that cause meningococcal disease, *Neisseria meningitidis* (or meningococcus).² Incidence of each group can vary by country and region, and can shift over time, making it impossible to determine the groups that will result in the majority of cases each year.² Even within Europe, the dominant group causing meningococcal disease cases can vary widely. Travel may increase the chance of carrying home and introducing new groups to countries (and individual households) in which they previously were not present.

Meningococcal serogroups A, B, C, W-135 and Y cause the majority of meningococcal disease cases worldwide.²

Global Distribution of Meningococcal Disease Bacteria Groups

Shifting Distribution of Meningococcal Disease Bacteria Groups



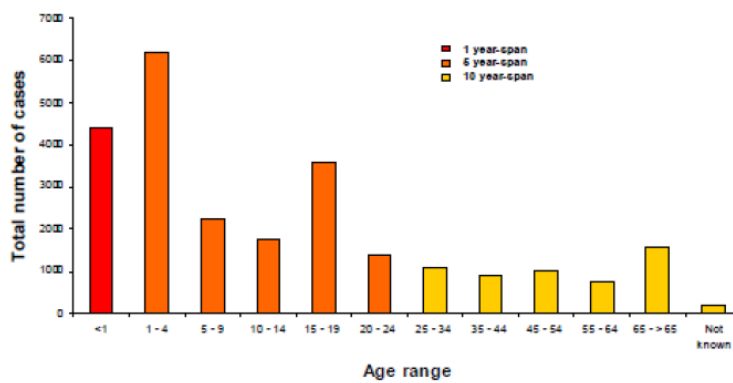
¹Public Health Agency of Canada. Canada Communicable Disease Report (CCDR) June 2007;33:1-15. ²CDC. Active Bacterial Core Surveillance Report, Emerging Infections Program Network, *Neisseria meningitidis*, 2007. ³Ines Agudelo C, et al. *Emerg Infect Dis* 2008;14:990-991. ⁴Ciccione F, et al. *BEPA*, 2006;3:7-12. ⁵Chiavetta L, et al. *Revista Argentina de Microbiología* 2007;39:21-27. ⁶Health Protection Agency, available at http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1234859711901. ⁷Nicolas P, et al. *J Clin Microbiol* 2005;43:5129-5135. ⁸Coulson GB, et al. Group for Enteric, Respiratory and Meningeal Disease Surveillance in South Africa. *Emerg Infect Dis* 2007;13:273-281. ⁹Chou GS, et al. *BMC Infect Dis* 2006;6:25. ¹⁰Takahashi H, et al. *J Med Microbiol* 2004;53:657-662. ¹¹Australian Meningococcal Surveillance Programme. *CMI* 2007;31:185-193. ¹²Martin D, et al. Wellington, New Zealand: Ministry of Health, 2007. ¹³*Neisseria meningitidis*; 1998-2007; 3. Lemos HP, et al. *J med microbiol*. <http://dx.doi.org/10.1099/jcm.2006.011111>. ¹⁴Alconne RT, et al. *PLoS ONE* 2007;2:e1122. ¹⁵Estadísticas de la vigilancia en salud pública. *Neisseria meningitidis* (aislamientos invasores). Instituto Nacional de Salud Web site. http://www.ins.gov.co/pdf/investig/Microbiologia_rm_07_jun.pdf. Updated June 30, 2007. ¹⁶EU-IBIS Network. *Neisseria meningitidis* in Europe 1999-2006. www.eubis.org; 7. Al-Mazrou, et al. *Saudi Med J* 2004;25:1410-1413; 8. Balmer P, et al. *J Med Microbiol* 2002;51:717-722.

Infants and Adolescents At Risk

Anyone can contract meningococcal disease, but infants and adolescents are particularly susceptible.^{2,8} Babies in the first year of life are the most vulnerable population, and they represent the greatest unmet need for an effective vaccine.² Adolescents and young adults, though, have an unusually high case fatality rate from meningococcal disease.⁸ In fact, a study in the United States found that nearly a quarter of meningococcal disease infections in people 15 to 24 years of age were fatal.⁸

Approximately 5-10% of people who contract meningococcal disease will die even with early and appropriate treatment.⁶

Distribution of Meningococcal Disease Cases in the EU, 2000-2004



Transmission

At any given time, it is believed that up to 10-20 percent of people worldwide can carry the bacteria that cause meningococcal disease in their nose and throat without showing any symptoms.⁹ Once acquired, a person can carry meningococcal bacteria for up to five or six months.¹⁰ Less than 1 percent of carriers will develop the disease, but they may spread the bacteria to others while they carry it.² In fact, close contact with a carrier can increase the risk of acquiring the bacteria by 800 fold.²

The bacteria that cause meningococcal disease can be passed easily between people through coughing, sneezing and direct contact, such as kissing.⁶

Most cases of meningococcal disease occur in previously healthy people without any warning.¹¹ Transmission of the disease is often associated with changes in lifestyle that put people in new situations and close contact for an extended period of time, and increase the number of people they encounter.³ Even small changes in lifestyle – such as going out to clubs, travelling, smoking, going to college or military duty – can increase the likelihood to become a carrier of meningococcal bacteria and the chance of a person contracting meningococcal disease.¹³

Adolescents and young adults are more likely to carry the bacteria than other age groups and can transmit the bacteria to infants.¹²

Importance of Effective Vaccination Against Multiple Groups

According to the WHO, the most effective way to prevent and control meningococcal disease is through the use of a single vaccine that offers protection against as many bacteria groups possible.⁵ Vaccination campaigns against two other leading causes of bacterial meningitis and sepsis – Haemophilus influenzae type B (Hib) and Streptococcus pneumoniae (pneumococcus) – have been up to 99 percent effective in reducing disease incidence and death caused by these illnesses.^{13,14} Meningococcal disease, caused primarily by five major groups of the bacteria *N. meningitidis*, is the third and final form of bacterial meningitis yet to be completely addressed by vaccines.¹

The WHO and several national governments recommend the use of meningococcal vaccination for people considered to be at increased risk for developing meningococcal disease, including:^{6,13}

- **Infants**
- **Adolescents**
- **Travelers to areas known for outbreaks**
- **Military personnel**
- **Muslim pilgrims travelling to the Hajj or Umrah**

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