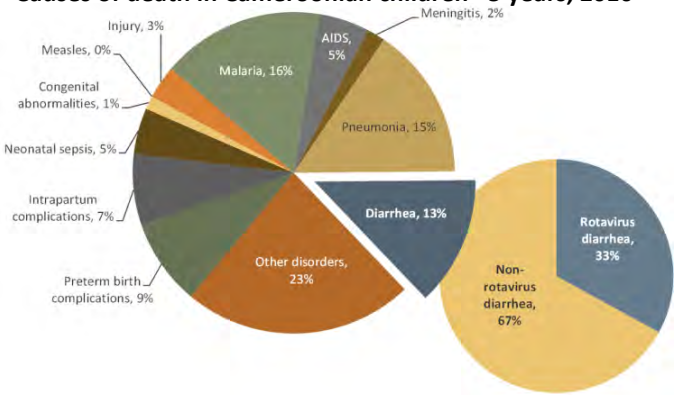
Rotavirus disease and vaccines in Cameroon

Diarrhea is a leading killer of children in Cameroon, causing approximately 13 percent of deaths in children less than five years of age.[1] Rotavirus, the most common cause of severe and fatal diarrhea in young children worldwide, takes the lives of more than 5,800 Cameroonian children under five each year.[2,3] It is estimated that 33 percent of all under-five diarrheal disease hospitalizations in Cameroon are caused by rotavirus.[4] Studies in Africa show that rotavirus vaccines are safe and effective against severe rotavirus disease and are cost-effective.[5-7]

In early 2014, Cameroon will introduce rotavirus vaccines into its national immunization program with GAVI support. The burden of rotavirus disease in Cameroonian children, coupled with the power of rotavirus vaccines to prevent childhood deaths and hospitalizations, underscores the potential for Cameroon's introduction of rotavirus vaccines to save children's lives.

Causes of death in Cameroonian children <5 years, 2010[1,3]



ROTAVIRUS IS THE LEADING CAUSE OF SEVERE AND FATAL DIARRHEA IN AFRICAN CHILDREN <5 YEARS OLD

Globally, rotavirus causes more than 450,000 deaths each year in children under five and is responsible for millions of hospitalizations and clinic visits.[2,3,8] Nearly a quarter of a million African children die from the dehydrating diarrhea caused by rotavirus infection every year, accounting for more than 50 percent of the global total of rotavirus deaths.[2,3] The vast majority of countries with the highest child death rates from rotavirus are in sub-Saharan Africa.[2,3]

ROTAVIRUS TREATMENT AND PREVENTION STRATEGIES

Rotavirus is highly contagious and spreads easily from person-to-person through contaminated hands and objects. It cannot be treated with antibiotics or other drugs. Mild rotavirus infections can be treated effectively in the same manner as other forms of diarrhea, by providing fluids and salts (oral rehydration therapy). However, children with severe rotavirus diarrhea can become dehydrated and often need intravenous fluids or they risk dying. In developing countries, this type of urgent health care is often inaccessible or unavailable, making rotavirus prevention through vaccination critical to saving children's lives.

Cameroon Facts

Total population (2012)[9]: 21,699,631
Population children <5 (2012)[10]: 3,571,565
Total live births (2012)[10]: 819,976
Mortality rate children <5 (2012)[10]: 95/1,000 live births
Total number <5 deaths (2010)[1]: 93,191
Number of <5 deaths due to diarrhea (2010)[1]: 12,150
Number of <5 deaths due to rotavirus (2008)[2]: 5,825

Vaccination is the best way to prevent severe rotavirus disease and the deadly, dehydrating diarrhea that it causes. Improvements in water quality, hygiene, and sanitation stop bacteria and parasites that cause other forms of diarrhea but do not prevent the spread of rotavirus. Lifesaving rotavirus vaccines should be introduced as part of a comprehensive approach to control diarrhea, along with other interventions including oral rehydration therapy, exclusive breastfeeding, zinc treatment, and improvements in water and sanitation.

TWO SAFE AND EFFECTIVE ROTAVIRUS VACCINES ARE SAVING LIVES TODAY

There are currently two orally administered rotavirus vaccines available: Rotarix®, manufactured by GlaxoSmithKline, and RotaTeq®, manufactured by Merck & Co., Inc. Both vaccines have been shown to be safe and effective in large-scale clinical trials in Africa, Asia, Europe, Latin America, and the US. Clinical trials in Africa (South Africa, Ghana, Kenya, Malawi, and Mali) found that rotavirus vaccines reduced severe rotavirus disease by more than 60 percent during the first year of life, when children are at greatest risk of severe rotavirus disease.[5,6]

In June 2009, based in part on results from clinical trials in Africa demonstrating that rotavirus vaccines significantly

reduced rotavirus disease in impoverished, high-mortality settings, the WHO Strategic Advisory Group of Experts recommended that rotavirus vaccines be included in all countries' national immunization programs.[11] As of March 1, 2014, more than 50 countries have introduced rotavirus vaccines in their national immunization programs, including more than 10 in Africa.[12] Twelve African countries in addition to Cameroon have been approved by GAVI for rotavirus vaccine support.[13]

Rotavirus vaccines are saving lives and improving health in countries where children have access to them. Swift and significant declines in hospitalizations and deaths due to rotavirus and all-cause diarrhea have been observed in many countries with rotavirus vaccines in their national immunization programs.[14] Rotavirus vaccines may protect unvaccinated children and adults by reducing spread of rotavirus (an effect called herd immunity).[14]

COMPREHENSIVE DIARRHEA CONTROL IN CAMEROON

In 2008, the World Wildlife Fund in partnership with Johnson & Johnson, began providing training and tools for residents in and around Cameroon's Lobeke National Park to build latrines.[15] The introduction of latrines led to rapid declines in diarrhea admissions in the region.[15]

The integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD) is a plan to combat diarrhea and pneumonia together through protection, prevention, and treatment strategies.[16] These strategies are reflected in Cameroon's latrine program and its GAVI-supported introduction of pneumococcal vaccines in 2011. With the addition of rotavirus vaccines, Cameroon is taking another step toward operationalizing the GAPPD approach and will be equipped with the tools to prevent deadly rotavirus diarrhea in young children.

ROTAVIRUS VACCINES ARE COST-EFFECTIVE AND A WISE INVESTMENT

Rotavirus vaccines are cost-effective, and in GAVI-eligible countries, where 95 percent of deaths due to rotavirus occur, more than 2.4 million child deaths can be prevented by 2030 by accelerating access to lifesaving rotavirus vaccines.[6] If used in all GAVI-eligible countries, rotavirus vaccines could prevent an estimated 180,000 deaths and avert 6 million clinic and hospital visits each year, thereby saving US$68 million annually in treatment costs.[7]

Rotavirus vaccines are an essential, lifesaving intervention in comprehensive diarrhea control. Accelerating access to rotavirus vaccines will not only save the lives of Cameroonian children but also lessen the heavy economic and health burden of rotavirus disease, contributing to poverty reduction and economic growth. GAVI and its partners plan to support the introduction of lifesaving rotavirus vaccines in more than 30 of the world's poorest countries by 2015.

For more information on rotavirus disease and vaccines please visit **http://rotavirus.org**.

REFERENCES

[1]Liu L, Johnson HL, Cousens S, et al. Global, regional, and national causes of child mortality: an updated systematic analysis for 2010 with time trends since 2000. *The Lancet*. 2012;379(9832):2151–2161.
[2]World Health Organization. 2008 rotavirus deaths, under 5 years of age, as of 31 January 2012 [spreadsheet]. Available at: http://www.who.int/immunization/monitoring_surveillance/burden/estimates/rotavirus/en/index.html. Accessed February 5, 2014.
[3]Tate JE, Burton AH, Boschi-Pinto C, et al. 2008 estimate of worldwide rotavirus-associated mortality in children younger than 5 years before the introduction of universal rotavirus vaccination programmes: a systematic review and meta- analysis. *The Lancet Infectious Diseases*. 2012;12(2):136–141.
[4]World Health Organization. Global Rotavirus Information and Surveillance Bulletin, Volume 7: February 2013. Available at: http://www.who.int/immunization/diseases/rotavirus/RV_bulletin_Jan_June_2012_Final.pdf. Accessed February 5, 2014.
[5]Madhi SA, Cunliffe NA, Steele D, et al. Effect of human rotavirus vaccine on severe diarrhoea in African infants. *New England Journal of Medicine*. 2010;362(4):289–298.
[6]Armah GE, Sow SO, Breiman RF, et al. Efficacy of pentavalent rotavirus vaccine against severe rotavirus gastroenteritis in infants in developing countries in sub-Saharan Africa: a randomised, double-blind, placebo-controlled trial. *The Lancet*. 2010;376(9741):606–614.
[7]Atherly DE, Lewis KDC, Tate J, Parashar UD, Rheingans, RD. Projected health and economic impact of rotavirus vaccination in GAVI-eligible countries: 2011-2030. *Vaccine*. 2012;30(1S):A7–A14
[8]Parashar UD, Hummelman EG, Bresee JS, Miller MA, Glass RI. Global illness and deaths caused by rotavirus disease in children. *Emerging Infectious Diseases*. 2003;9:565–572.
[9]Population, total page. World Bank website. Available at: http://data.worldbank.org/indicator/SP.POP.TOTL. Accessed February 5, 2014.
[10]UNICEF. Under-five mortality dashboard page. Child Info website. Available at: www.childinfo.org/mortality_underfive_dashboard.html. Accessed February 5, 2014.
[11]World Health Organization. Meeting of the immunization Strategic Advisory Group of Experts, April 2009—conclusions and recommendations. *Weekly Epidemiological Record*. 2009;84(23):220–236.
[12]Page on Country introductions of rotavirus vaccines | Maps and list. PATH website. Available at: http://sites.path.org/rotavirusvaccine/rotavirus-advocacy-and-communications-toolkit/country-introduction-maps-and-list/. Accessed Feb. 5, 2014.
[13]Countries approved for support. GAVI Alliance website. Available at: http://www.gavialliance.org /results/countries-approved-for-support. Accessed February 5, 2013.
[14]Page on Tables | Rotavirus vaccine impact. PATH website. Available at: http://sites.path.org/rotavirusvaccine/rotavirus-advocacy-and-communications-toolkit/rotavirus-vaccine-impact-tables/. Accessed February 5, 2014.
[15]WHO and UNICEF. The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD). 2013. Available at: http://defeatdd.org/global-action-plan. Accessed February 5, 2014.
[16]PATH. Diarrheal Disease: Solutions to Defeat a Global Killer. 2009. Available at: http://www.path.org/publications/files/IMM_solutions_global_killer.pdf. Accessed February 5, 2014.

PATH
A catalyst for global health
www.path.org

PATH is an international organization that drives transformative innovation to save lives and improve health, especially among women and children. We accelerate innovation across five platforms—vaccines, drugs, diagnostics, devices, and system and service innovations—that harness our entrepreneurial insight, scientific and public health expertise, and passion for health equity. By mobilizing partners around the world, we take innovation to scale, working alongside countries primarily in Africa and Asia to tackle their greatest health needs. Together, we deliver measurable results that disrupt the cycle of poor health.

STREET ADDRESS
2201 Westlake Avenue
Suite 200
Seattle, WA 98121 USA

MAILING ADDRESS
PO Box 900922
Seattle, WA 98109 USA

March 2014