R&D for **Maternal, Newborn & Child Health**

How new tools can transform the fight

GHTC global health technologies coalition

The chances of a mother and her child surviving and thriving are vastly different depending on where in the world they live. For example, around 83% of all global maternal and child deaths occur in sub-Saharan Africa and southern Asia, yet these regions only account for 57% of live births. Having the right intervention or tool at the right time is one of the most crucial factors for survival. Thanks to global efforts to develop and scale up health solutions, child deaths have declined worldwide by 62% and maternal deaths by nearly 46% since 1990. But vast challenges remain. Intensified research and development (R&D) efforts are needed to deliver pediatric versions of existing and novel medicines and to ensure products are suitable for use in pregnant and lactating women and individuals, as well as to create low-cost, easy-to-use technologies to address common causes of maternal and child deaths in the world's poorest places.

4.9 million
children under five die each year

287,000 women
die each year in pregnancy and childbirth

218 million
women have an unmet need for contraception

Research successes

New technologies have driven significant improvements in maternal, newborn, and child health (MNCH):

- **Vaccines against childhood diseases**, including polio, measles, diphtheria, tetanus, pneumonia, and other illnesses, have saved more than 150 million children over the past 50 years.
- **Contraceptive innovations**, from decades-old tools like oral pills and implants to newer technologies like self-insertable, three-month and one-year vaginal rings, as well as discreet, self-injectable, and long-acting contraception options, have helped millions of women meet their unique family planning (FP) needs.
- **Tools to prevent and treat malaria** in mothers and children—including **insecticide-treated bednets**, **chemoprevention** for children and pregnant women, **child-friendly medicines**, and **vaccines**—have significantly reduced maternal and child deaths.
- **Interventions to treat and prevent diarrhea**—including oral rehydration solutions, zinc supplements, and low-cost vaccines against rotavirus, cholera, and typhoid—have helped reduce child mortality from diarrheal disease by more than half since 2000.
- **Nutrition innovations**, like biofortified crops and vitamin supplements, are helping more children thrive.
- **Approaches to prevent maternal-to-child transmission of HIV** have contributed to a 62% decline in new infections in children since 2010.

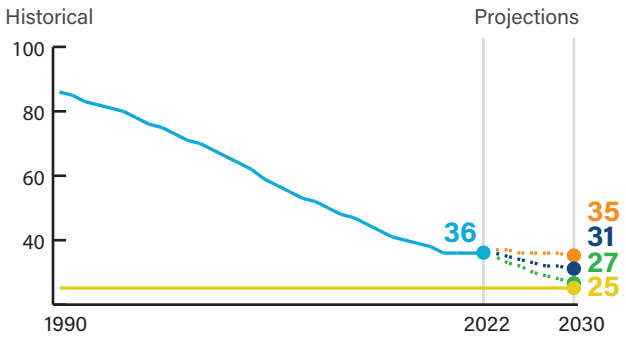
Key missing tools

New tools that are designed specifically for low-resource settings are needed to advance MNCH, including:

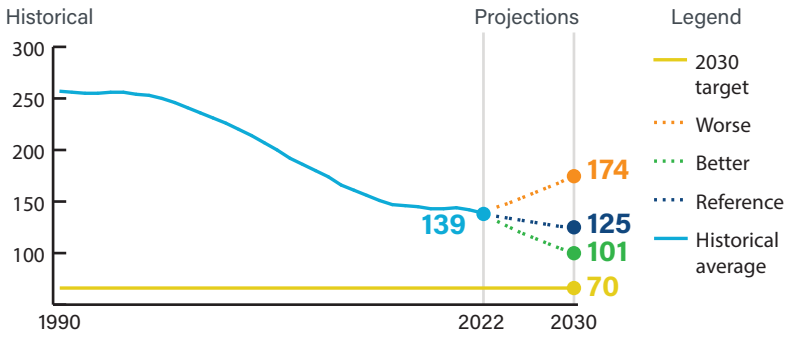
- **Better tools to manage respiratory disorders and pneumonia** in facilities without high-tech equipment, including low-cost, durable, and easy-to-use neonatal resuscitators and ventilators to help babies breathe and affordable, easy-to-operate tools to monitor respiratory rates and oxygen levels in children.
- **Vaccine innovations to improve immunization coverage** for vulnerable, hard-to-reach populations, such as heat-stable versions of vaccines that can be stored without refrigeration or easy-to-use, pain-free oral formulations.
- **Child-friendly formulations of existing and new medicines** that are appropriately dosed, dissolvable, and more palatable.
- **Better tools to prevent postpartum hemorrhage**, the leading cause of maternal death, including new, easily administered, and heat-stable formulations of the drug oxytocin for use in settings without reliable electricity and low-cost, simple devices to control and monitor the severity of bleeding after childbirth.
- **Simple, low-cost tools to detect preeclampsia**, a dangerous pregnancy complication, including handheld blood pressure monitoring devices and other improved point-of-care diagnostics.
- **New contraceptive options** with minimal side effects that are suitable for people living in remote areas with limited access to health care services, including multipurpose products for women that simultaneously prevent HIV and sexually transmitted infections while providing contraception and novel contraceptive options for men.
- **Better treatments and prevention options for pregnant and lactating women and individuals** across a range of health areas.
- **New lost-cost and easy-to-administer tools to address other leading MNCH challenges**, including obstructed labor, preterm birth, diarrheal disease, malaria, HIV/AIDS, and malnutrition.

Continued progress is possible, not inevitable

Under-5 deaths per 1,000 live births



Maternal deaths per 100,000 live births



Breakthroughs on the brink

- An **oxytocin inhaler** designed to manage postpartum hemorrhage after childbirth, even in settings with no electricity and refrigeration and limited access to trained health workers, is under development. The product, which received support from USAID, could save the lives of almost 20,000 new mothers each year.
- A **first-of-its-kind malaria treatment designed specifically for babies less than ten pounds** has completed Phase 2/3 trials. There is no approved treatment for babies in this weight group, who are currently treated with a partial dose of medicines made for larger children, which can heighten risk of overdose among this very vulnerable population.
- The **OdonAssist™**, a promising new tool previously supported by USAID, that uses air pressure and suction to gently assist with delivery during obstructed labor, is advancing through clinical trials.
- **Vaccines against Shigella and enterotoxigenic *Escherichia coli***, two leading causes of diarrheal disease, are in clinical development with DoD support. To date, no effective vaccines are available against these pathogens.
- **New contraceptive innovations**, including a microneedle contraceptive patch lasting six months supported by USAID, a male contraceptive gel now in clinical trials supported by NIH, and a vaginal ring and dual-use prevention pill that combine contraception with antiretroviral treatments to prevent HIV infection supported by USAID and NIH.
- Zoliflodacin, a new antibiotic that completed Phase 3 trials, which, if approved, would become the **first new antibiotic for treating gonorrhea** in decades. In addition to causing health issues in women, gonorrhea can be passed from a pregnant person to their baby, leading to serious problems, including blindness and a life-threatening blood infection.
- **Affordable, rapid, and point-of-care urine tests to diagnose preeclampsia**, including a simple paper urine test supported by USAID, are now undergoing validation testing. These tools, designed for low-resource settings, will improve the detection of this deadly condition that impacts 1 in 20 women during pregnancy.

US Government R&D efforts

The US government is advancing MNCH research through a whole-of-government approach:

- **US Agency for International Development** (USAID) develops and distributes affordable vaccines, treatments, and other tools to improve MNCH globally and address FP and reproductive health (RH) needs, leading implementation of the US government's MNCH and FP/RH activities.
- **National Institutes of Health** (NIH) conducts basic science and implementation research to develop and improve tools to advance MNCH and FP/RH.
- **Centers for Disease Control and Prevention** operates immunization programs, conducts surveillance and epidemiological research to inform the use of existing MNCH tools, and provides technical assistance to country partners to strengthen public health capacity.
- **Department of Defense** (DoD) supports research against diseases like malaria and diarrheal diseases that pose a risk to service members stationed abroad and that are also leading killers of children.

R&D for **Maternal, Newborn & Child Health**
advancing **innovation** to save lives

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