

Priority life-saving medicines for women and children 2012

Improving maternal and child health is a global priority. An estimated 7.6 million children under the age of five die every year and an estimated 1 000 women – most of them in developing countries– die every day due to complications related to pregnancy or childbirth. Many of these deaths are due to conditions that could be prevented or treated with access to simple, affordable vaccines, contraceptives and medicines. However, the availability of medicines at public-health facilities is often poor.

IMPROVING HEALTH AND SAVING LIVES BY ENSURING ACCESS TO PRIORITY MEDICINES

This list of priority life-saving medicines for women and children was developed by the World Health Organization departments of Essential Medicines and Health Products; Maternal, Newborn, Child and Adolescent Health; and Reproductive Health and Research, and UNFPA and UNICEF to help countries and partners select and make available those medicines that will have the biggest impact on reducing maternal, newborn and child morbidity and mortality.

The medicines on this list were chosen according to 1) the global burden of disease; 2) the evidence of efficacy and safety for preventing or treating major causes of sexual and reproductive, maternal, newborn and child mortality and morbidity. In addition, medicines were included for palliative care. All of the medicines listed are included in the current versions of the WHO Model List of Essential Medicines (EML), the WHO EML for Children (with the exception of dexamethasone and betamethasone) and WHO treatment guidelines. Medicines were selected from the core essential medicines list with one exception, to prioritize those medicines that can be used throughout health care systems.

The *Priority medicines for mothers and children* 2011 list was updated following the 18th Expert Committee Meeting on Selection and Use of Medicines, the release of new treatment guidelines and feedback from partners following the 2011 version. In alignment with the UN Global strategy for women's and children's health; and the recently launched UN Commission on life-saving commodities for women and children, the title of this updated list is renamed as *Priority Life-Saving Medicines for Women and Children*.

Updates to the list of priority life-saving medicines for mothers include: the addition of misoprostol for the prevention of post-partum haemorrhage; the additions of hydralazine and methyldopa for the treatment of severe pregnancy- induced hypertension and the removal of the 2-ml vial of magnesium sulfate; the addition of misoprostol and mifepristone for the provision of safe abortion services; the addition of tetanus vaccine for the prevention of tetanus in mothers and children; and the addition of contraceptives. Procaine benzylpenicillin was removed from the list of medicines for treatment of pneumonia in children; higher dosage forms for neonatal sepsis were removed; an explanatory note on the gentamicin formulation was added and a referral to guidance on vaccines was made. The list of *priority medicines required for child health and survival, but for which further research and development is needed* was removed from this update to reflect the need to advocate separately for these medicines.

CONTACT World Health Organization

Department of Essential Medicines and Health Products Email: pedmeds@who.int
Department of Reproductive Health and Research Email: reproductivehealth@who.int
Department of Maternal, Newborn, Child and Adolescent Health Email: mncah@who.int

Priority life-saving medicines for children under five years of age

for major causes of mortality and morbidity, palliative care and child survival

Pneumonia^{1,2,3}

Pneumonia is the single biggest cause of death in children, killing an estimated 1.4 million children under the age of five years annually and accounting for 18% of all deaths of children under five years old worldwide.

Amoxicillin: dispersible, scored tablets 250 mg and 500 mg or equivalent flexible oral solid dosage form, in blister packs of 10

Ampicillin: powder for injection 500 mg and 1g

Ceftriaxone: powder for injection 250 mg and 1 g

Gentamicin: injection 40 mg/ml; 20 mg/ml^a

Oxygen: medicinal gas

Diarrhoea⁴

Diarrhoeal disease is the second leading cause of death and a leading cause of malnutrition in children under five years old, killing more than 1.2 million children every year.

Oral rehydration salts (ORS):⁵ sachets of 200 ml; 500 ml and 1 litre, appropriate flavour

Zinc: 20 mg scored dispersible tablet or equivalent flexible oral solid dosage form

Malaria³⁰

Every minute a child dies of malaria in Africa. In 2010, there were 247 million cases of malaria and 600 000 deaths – mostly among children living in Africa.

Artemisinin combination therapy (ACT): strengths and combinations according to WHO treatment guidelines 2010, dispersible tablet or flexible oral solid dosage form and dose optimized

Artesunate: rectal and injection dosage forms 50–200 mg

Neonatal sepsis¹

One quarter of the estimated 3.1 million neonatal deaths around the world each year are caused by severe infections, and around 457 000 of those are due to neonatal sepsis alone.

Ampicillin: powder for injection 250 mg and 500 mg

Ceftriaxone: powder for injection 250 mg and 500 mg

Gentamicin: injection 40 mg/ml; 20 mg/ml^a

Procaine benzylpenicillin: powder for injection 1 g (not recommended as first-line treatment except in cases where hospital care is not achievable in high neonatal mortality settings)

HIV^{6,7,8}

An estimated 2.1 million children were living with HIV at the end of 2008, 1.8 million of them in sub-Saharan Africa. Most infections are the result of transmission from mother to child. Without effective treatment, an estimated one third of infected infants will have died by one year of age, and about half will have died by two years of age.

Standard regimen for first-line antiretroviral treatment:

1 non-nucleoside reverse transcriptase inhibitor plus
2 nucleoside reverse transcriptase inhibitors such as the fixed-dose combination of lamivudine + nevirapine + zidovudine — tablet 30 mg + 50 mg + 60 mg;
150 mg + 200 mg + 300 mg

For treatment of specific populations, see the latest WHO treatment guidelines

Vitamin A deficiency⁹

Vitamin A deficiency is a recognized risk factor for severe measles. An estimated 76 000 children under five years died from measles in 2010.

Vitamin A: capsule 100 000 IU strength; 200 000 IU strength

Palliative care and pain¹⁰

Although means to relieve severe pain are widely available, their use in children is often limited.

Morphine: granules 20 mg, 30 mg, 60 mg, 100 mg, 200 mg; injection 10 mg/ml, oral liquid 10 mg/5 ml, variable flexible oral solid dosage forms

Paracetamol: variable flexible oral solid dosage forms

Vaccines¹¹

In 2008, WHO estimated that 1.5 million of deaths among children under five years were due to diseases that could have been prevented by routine vaccination.

See WHO guidelines^{12,13}

^a. Gentamicin 40 mg/ml is an adult formulation, adaptable to older children but unsuitable for neonates. 10 mg/ml is ideal for intravenous administration in neonates but unsuitable for intra-muscular injection in the outpatient setting where many receive care. The 20 mg/ml formulation is ideal for neonates and children, however this is not currently manufactured. Dilutions of the 40 mg/ml formulation will need to be made until that time when the 20 mg/ml formulation is available.



Priority life-saving medicines for women

for major causes of sexual and reproductive health related mortality and morbidity

Post-partum haemorrhage^{14,15,16}

Obstetric haemorrhage is the world's leading cause of maternal mortality causing an estimated 127 000 maternal deaths annually. Postpartum haemorrhage is the most common type.

Prevention

Oxytocin: injection 10 IU in 1-ml ampoule

Misoprostol: tablet 200 micrograms (when oxytocin is not available or cannot safely be used)

Treatment

Oxytocin: (as above)

Sodium chloride: injectable solution 0.9% isotonic or

Sodium lactate compound: injectable solution (Ringer's lactate) for infusion

Severe pre-eclampsia and eclampsia¹⁷

Pre-eclampsia and eclampsia are major health problems in developing countries. Every year, eclampsia is associated with an estimated 50 000 maternal deaths worldwide.

Severe pre-eclampsia and eclampsia¹⁸

Magnesium sulfate: injection 500 mg/ml in 10-ml ampoule

Calcium gluconate injection (for treatment of magnesium toxicity): 100 mg/ml in 10-ml ampoule

Management of severe hypertension¹⁹

Hydralazine: powder for injection 20 mg (hydrochloride) in ampoule or tablet 25 mg; 50 mg (hydrochloride)

Methyldopa: tablet 250 mg

Maternal sepsis^{16,17,20,21}

Infection can follow an abortion or childbirth and is a major cause of death. Sepsis that is not related to unsafe abortion accounts for up to 15% of maternal deaths in developing countries.

Ampicillin: powder for injection 500 mg; 1 g (as a sodium salt) in vial

Gentamicin: injection 40 mg/ml in 2-ml vial

Metronidazole: injection 500 mg in 100-ml vial

Provision of safe abortion services and/or the management of incomplete abortion and miscarriage^{20,21}

Unsafe abortion complications can lead to death associated with haemorrhage and sepsis. The majority of unsafe abortions take place in developing countries. In 2008, it was estimated that 21.6 million unsafe abortions were performed worldwide—the majority of these in developing countries. Each year, 47 000 women die due to complications of unsafe abortion.

Misoprostol: tablet 200 micrograms

Mifepristone + misoprostol*: tablet 200 mg + tablet 200 micrograms (where permitted under national law)

* requires close medical supervision

Sexually transmitted infections^{22,23,24}

Nearly a million people acquire a sexually transmitted infection, including the human immunodeficiency virus (HIV), every day. After pregnancy-related causes, sexually transmitted infections are the second most important cause of healthy life lost in women. The results of infection include acute symptoms, chronic infection, and serious delayed consequences such as infertility, ectopic pregnancy, cervical cancer, and the untimely deaths of infants and adults. Many sexually transmitted infections affect the outcome of pregnancy and some are passed to unborn and newborn babies.

Uncomplicated genital chlamydial infections

Azithromycin: capsule 250 mg; 500 mg or oral liquid 200 mg/5 ml

Gonococcal infection – uncomplicated anogenital infection

Cefixime: capsule 400 mg

Syphilis²⁵

Benzathine benzylpenicillin: powder for injection 900 mg benzylpenicillin in 5-ml vial; 1.44 g benzylpenicillin in 5-ml vial

Management of preterm labour^{17,26,27,28}

The incidence of preterm birth is approximately 6–7% of all births. Preterm birth is the leading cause of neonatal mortality both in developed and developing countries, accounting for an estimated 24% of neonatal deaths.

Inhibition of uterine contractions²⁹

Nifedipine: immediate release capsule 10 mg

Improvement of fetal lung maturity

Dexamethasone: injection 4 mg dexamethasone phosphate (as disodium salt) in 1-ml ampoule or

Betamethasone: injection 6 mg/ml (3 mg/ml betamethasone sodium phosphate + 3 mg/ml betamethasone acetate) in an aqueous vehicle

Maternal HIV/AIDS and malaria

See WHO guidelines^{30,31}

Priority life-saving medicines for women (Continued)

for major causes of sexual and reproductive health related mortality and morbidity

Prevention of tetanus in mother and newborn³²

Maternal and neonatal tetanus have been among the most common lethal consequences of unclean deliveries and umbilical cord care practices. WHO estimates that in 2008, 59 000 newborns died from neonatal tetanus.

Tetanus vaccine

Contraception^{33,34,35}

Family planning through provision of modern contraceptives is one of the most effective strategies for reducing maternal death. Reducing the unmet need for family planning and thus, preventing unintended pregnancies, is estimated to reduce a third of maternal, and up to 10% of infant deaths³⁶.

Oral contraceptives such as ethinylestradiol + levonorgestrel: tablet 30 micrograms + 150 micrograms; levonorgestrel 750 micrograms (pack of 2); **Injectable contraceptives** such as estradiol cypionate + medroxyprogesterone acetate: injection 5 mg + 25 mg *or* medroxyprogesterone acetate: depot injection 150 mg/ml in 1-ml vial or norethisterone enantate 200 mg/ml in 1-ml ampoule; **Implantable contraceptives** such as levonorgestrel-releasing implant: 150 mg total
For **intrauterine devices and barrier methods** of contraception (e.g. condoms) see WHO EML³⁷

REFERENCES

1. *Pocket book of hospital care for children: guidelines for the management of common illnesses with limited resources*. Geneva, World Health Organization, 2005.
2. *Technical updates of the guidelines on the Integrated Management of Childhood Illness (IMCI): evidence and recommendations for further adaptations*. Geneva, World Health Organization, 2005.
3. Theodoratou E et al. The effect of case management on childhood pneumonia mortality in developing countries. *Int J Epi*. 2010, 39(suppl 1): i155-i171.
4. *Treatment of diarrhoea: a manual for physicians and other senior health care workers*. Geneva, World Health Organization, 2005.
5. Munos M, Fischer Walker CL, Black RE. The effect of Oral Rehydration Solution and Recommended Home Fluids on diarrhea mortality. *Int J Epi*. 2010, 39:i75-i87.
6. *Antiretroviral therapy for HIV infection in infants and children: towards universal access: recommendations for a public health approach*. Geneva, World Health Organization, 2010.
7. *Rapid advice : use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants*. Version 2. Geneva, World Health Organization, 2010.
8. *HIV diagnosis and treatment in infants and children*. Geneva, World Health Organization, 2010.
9. Yang HM, Mao M, Wan CM Vitamin A for treating measles in children (Review). *Cochrane Review*, 2009 (3).
10. *WHO guidelines on the pharmacological treatment of persisting pain in children with medical illnesses*. Geneva, World Health Organization), Geneva, World Health Organization, 2012.
11. Vaccine-preventable diseases – The burden www.who.int/immunization_monitoring/diseases/, accessed 19 March 2012.
12. WHO vaccine position papers www.who.int/immunization/position_papers/en/, accessed 19 March 2012.
13. WHO recommendations for routine immunization – summary tables www.who.int/immunization/policy/immunization_tables, hohodshodh accessed 19 March 2012.
14. *WHO recommendations for the prevention of postpartum haemorrhage*. Geneva, World Health Organization, 2007.
15. *WHO guidelines for the management of postpartum haemorrhage and retained placenta*. Geneva, World Health Organization, 2009.
16. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PFA. WHO analysis of causes of maternal death: a systematic review. *Lancet*, 2006, 367:1066-1074.
17. *Managing complications in pregnancy and childbirth: a guide for midwives and doctors*. Geneva, World Health Organization, 2000 (Integrated management of pregnancy and childbirth).
18. Duley L. Maternal mortality associated with hypertensive disorders of pregnancy in Africa, Asia, Latin America and the Caribbean. *British Journal of Obstetrics and Gynaecology*, 1992, 99:547-553.
19. *WHO recommendations for prevention and treatment of pre-eclampsia and eclampsia*. Geneva, World Health Organization, 2011.
20. Kulier R, Gülmezoglu AM, Hofmeyr GJ, Cheng LN, Campana A. Medical methods for first trimester abortion. *Cochrane Database of Systematic Reviews*, 2007, Issue 4. Art. No.: CD002855. DOI: 10.1002/14651858.CD002855.pub3.
21. *Unsafe abortion: global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008*. Sixth edition. Geneva, World Health Organization, 2011.
22. *Global strategy for the prevention and control of sexually transmitted infections: 2006–2015: breaking the chain of transmission*. Geneva, World Health Organization 2007.
23. Glasier A, Gülmezoglu AM, Schmid GP, Moreno CG, Van look PF. Sexual and reproductive health: a matter of life and death. *Lancet*, 2006, 367: 1595-607.
24. *Guidelines for the management of sexually transmitted infections*. Geneva, World Health Organization, 2003.
25. Delport SD, Pattinson RC. Congenital and perinatal infections: prevention, diagnosis and treatment. Syphilis: prevention, diagnosis and management during pregnancy and infancy. In: Newell M-L, McIntyre J. Eds. *Cambridge, UK, Cambridge University Press* 2000;258-275.
26. King JF, Flenady VJ, Papatsonis DNM, Dekker GA, Carbone B. Calcium channel blockers for inhibiting preterm labour (Cochrane Review). In: *The Cochrane Library*, Issue 2, 2004. Chichester: John Wiley & Sons.
27. Martin JA, Hamilton BE, Ventura SJ, Menacker F, Park MM, Sutton PD. Births: final data for 2001. *National Statistics Report*, 2002, 51(2):1-104.
28. Abu-Rashid N, Al-Jirf S, Bashour H. Causes of death among Syrian children using verbal autopsy. World Health Organization, Regional Office for Eastern Mediterranean.
29. Darmstadt GL, Lawn JE, Costello A. Advancing the state of the world's newborns. *Bulletin of the World Health Organization*, 2003, 81:224-225.
30. *Guidelines for the treatment of malaria*. 2nd ed. Geneva, World Health Organization, 2010.
31. *Rapid advice: use of antiretroviral drugs for treating pregnant women and preventing HIV infection in infants*. Version 2. Geneva, World Health Organization 2010.
32. Black RE, Cousens S, Johnson HL et al. Global, regional, and national causes of child mortality in 2008: a systematic analysis. *Lancet* 2010, Issue 9730: 1969-1987.
33. *Pregnancy, childbirth, postpartum and newborn care: a guide for essential practice*. Geneva, World Health Organization, 2006.
34. *2008 Update of the WHO Selected Practice Recommendations for Contraceptive use*. Geneva, World Health Organization, 2004 www.who.int/reproductivehealth/publications/family_planning/9241562846index/en/index.html, accessed 6 January 2012.
35. *Medical Eligibility Criteria for Contraceptive Use*. Fourth ed 2009, Geneva, World Health Organization, 2010.
36. Singh S et al., *Adding It Up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health*, New York: Guttmacher Institute and United Nations Population Fund, 2009.
37. *WHO Model List of Essential Medicines*. Geneva, World Health Organization, www.who.int/medicines/publications/essentialmedicines.