

# The World Health Organization Program for Emergency Surgical, Obstetric, and Anesthetic Care

## *From Mongolia to the Future*

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**T**his special article provides an introduction to the World Health Organization (WHO) Emergency and Essential Surgical Care (EESC) program. The program was launched by the WHO in December of 2005 to address the lack of adequate surgical capacity as a global public health issue. The overall objective is to reduce death and disability from trauma, burns, pregnancy-related complications, domestic violence, disasters, and other surgically treatable conditions. The program and materials have spread to over 35 countries and focus on providing (1) basic education and training materials; (2) enhancement of surgical infrastructure at the governmental and health facility level; and (3) resources for monitoring and evaluating surgical, obstetrical, and anesthetic capacity. Additionally, a global forum for program members was established that collaborates with ministries of health, WHO country offices, nongovernmental organizations, and academia. The results of the third biennial meeting of global EESC members in Mongolia are outlined as well as future challenges.

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The global burden of diseases associated with surgical and obstetric care remains undefined. Among those who do have access to these types of care, an estimated 234 million surgical and obstetrical procedures are being performed annually.<sup>1</sup> When analyzed on a country level, the disparity between higher health expenditure countries and poor countries remains striking: 4 billion people undergo 96.5% of all surgical procedures, whereas the poorest 2 billion people undergo only 3.5% of all surgical procedures.<sup>1</sup>

### *See Invited Critique at end of article*

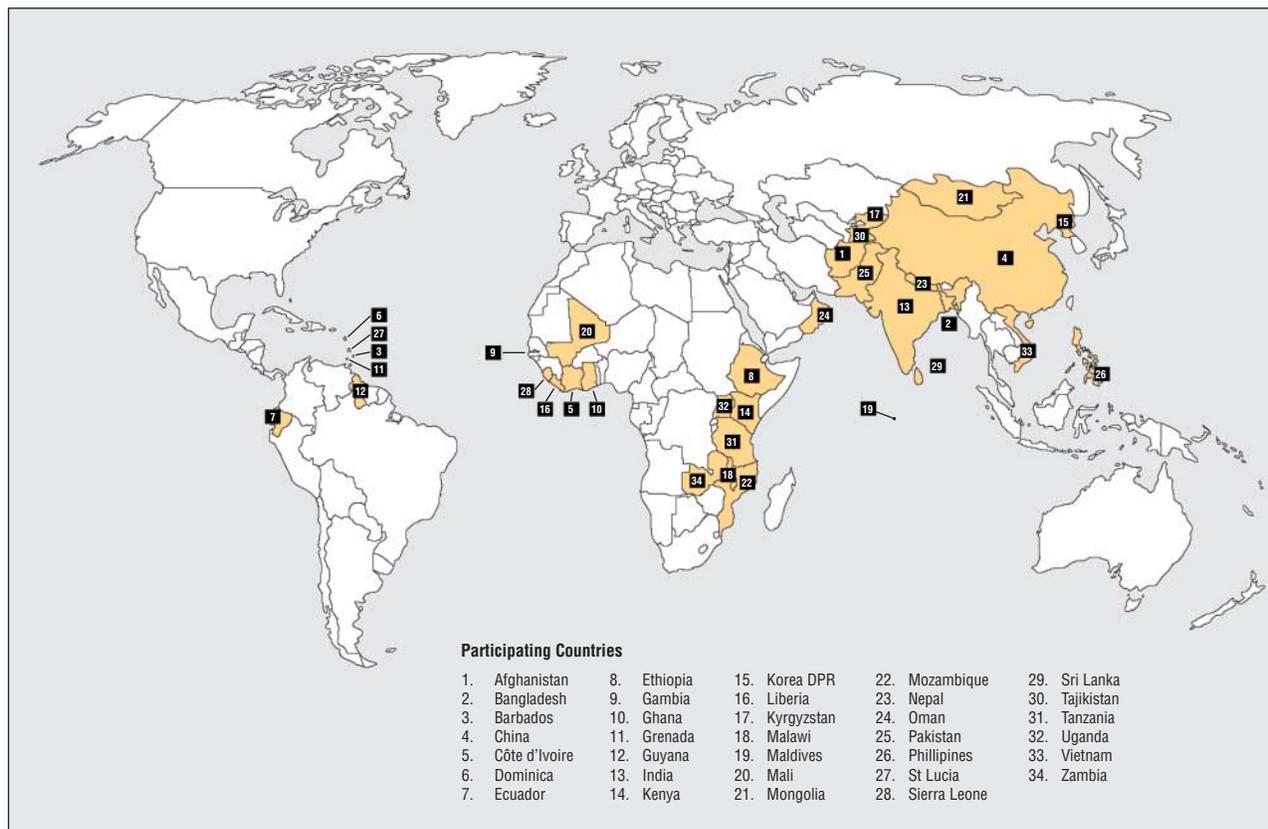
The range of what surgical care entails is staggering when the issue is considered carefully: all accidental trauma as well as complications of childbirth (including obstetrical fistula), inguinal hernias, cataracts, traumatic bone and soft-tissue injuries, circumcision for human immunodeficiency virus (HIV) prevention, newborns with congenital anomalies, and vic-

tims of genital mutilation among others. All of these patients share several common characteristics: (1) These types of conditions present to first-referral facilities in developing countries; (2) they require surgical and/or obstetric care and interventions; and (3) as part of their treatment, they also require some type of anesthesia. Despite these common characteristics of surgical, obstetric, and anesthetic procedures, there has been no previously successful global programmatic effort to support surgical services. To address this significant need, the World Health Organization (WHO) established the Emergency and Essential Surgical Care (EESC) program.

### OVERVIEW OF THE WHO EESC PROGRAM

The overall objective of the WHO EESC program is to reduce death and disability from road traffic accidents, trauma, burns, falls, pregnancy-related complications, domestic violence, disasters, and other surgically treatable conditions. Specifically, this is being achieved in over 35 countries by providing (1) basic education and training materials; (2) enhancement of surgical infrastructure at the governmental

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**Figure 1.** Country implementation map for the World Health Organization Emergency and Essential Surgical Care program. DPR indicates Democratic People's Republic.

and health facility level; and (3) resources for monitoring and evaluating surgical, obstetric, and anesthetic capacity. A global forum for program members was established that was entitled the WHO Global Initiative for Emergency and Essential Surgical Care (GIEESC); the GIEESC forum collaborates with ministries of health, WHO country offices, nongovernmental organizations, and academia. The efforts of the WHO EESC program and GIEESC forum have directly supported Millennium Development Goals 4 (reduce child mortality) and 5 (improve maternal health) in numerous countries.<sup>2</sup>

#### ORIGINS AND ACCOMPLISHMENTS OF THE WHO EESC PROGRAM

The origins of the WHO EESC program originated in 2004 when the WHO established the clinical procedures unit with the mission of ensuring efficacy, safety, and equity in the provision of clinical procedures in surgery, anesthesia, obstetrics, and orthopedics, particularly at district hospitals. In December 2005, the WHO formally began to address the lack of adequate surgical capacity for emergency and essential surgery for the first time in a global effort, recognizing surgical care as a major public health issue. Since that time, the WHO EESC program has programmatically focused efforts to increase education, safety, and capacity in the provision of surgical, anesthetic, and obstetric care at first-level health facilities and through preservice education in medical and nursing schools. These efforts have been done in a collabo-

orative effort, with the WHO creating a consortium of local, regional, and national health professionals from academia, nongovernmental organizations, and ministries of health in 34 countries (**Figure 1**).

#### THE WHO THIRD BIENNIAL MEETING OF THE GIEESC

The WHO held its third biennial meeting of the GIEESC at the Mongolian Parliament Building in June 2009 in Ulaanbaatar, Mongolia. The meeting brought together around 100 participants from 20 countries representing ministries of health, WHO country offices, nongovernmental organizations, professional and civil societies, and academicians who reported on their efforts in addressing the increasingly recognized global public health crisis of inadequate availability of surgical, obstetric, trauma, and anesthetic services (for additional details about the third biennial GIEESC meeting, please visit <http://www.who.int/surgery/globalinitiative/3rdGIEESCreport2009.pdf>).

Among the much-needed surgical services discussed, injury-related and obstetric care was at the forefront. Injuries kill more than 5 million people globally each year, accounting for 1 in 10 deaths, and an estimated 500 000 women die from pregnancy-related complications. Thus, it is not surprising that surgically treatable conditions account for an estimated 11% of the world's disability-adjusted life-years lost.<sup>3</sup> Participants emphasized that increasing attention needs to be given to

### Surgical Care at the District Hospital Manual

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**Figure 2.** Index of surgical care at the district-hospital level from surgical manual included in the World Health Organization Integrated Management for Emergency and Essential Surgical Care tool kit.<sup>4</sup>

surgical services that have a significant public health effect and, at times, may not fit classical definitions. For example, a patient with a multisystem injury who presents to a first-referral health facility after trauma will require surgical care although he or she may not require an operating room, general anesthesia, or even a surgeon for effective treatment. Similar examples were cited as common for pregnancy-related complications that also do not require an obstetrician or an anesthesiologist. Thus, the definitions, as they relate to surgical care, have to be broadened, and priority must be given to surgical services that will have the greatest public health effect.

Thus, it was reaffirmed that the definition of surgically treatable conditions should include (1) injury-related care (eg, road traffic accidents, fall-related injuries, burns, violence, and female genital mutilation); (2) pregnancy-related care (eg, obstructed labor, hemorrhage, and unsafe abortion); and (3) emergency and disability-preventive surgical care (eg, intestinal obstruction, appendicitis, hernias, clubfoot, cataracts, and male circumcision). Beyond provision of surgical and obstetric care, the need for anesthetic care (which is an integral component of hospital services both inside and outside the operating rooms for trauma, burns, radiology studies, obstetrics, and postoperative pain relief) was also recognized.

The consortium has generated a WHO Integrated Management for Emergency and Essential Surgical Care (IMEESC) tool kit that contains a range of training and assessment tools, including a basic fundamentals manual of surgical, obstetric, and anesthetic techniques as would be needed at the district-hospital level (**Figure 2**).<sup>4</sup> The tool kit is available on the Internet as an e-tool for dis-

tance learning and is maintained and updated by the clinical procedures unit along with the WHO GIEESC members. The surgical manual has been translated from English into Mongolian and Korean, and ongoing translations (eg, in Spanish, French, Dari, and Pashtu) are being made (**Figure 3**).

The selection of Mongolia as the location for the WHO GIEESC meeting was not surprising because the WHO EESC program is one that is designed to integrate within existing health systems and because Mongolia is one of the program's success stories. Mongolia has a total country population of 2.5 million inhabitants, with 1 million people living in the major city of Ulaanbaatar. Thus, with urban and rural populations, the health system is not atypical of a developing country and addresses the population's health care needs through a 3-tiered referral system; *sum* physicians serve as the first-level providers, with 21 provincial *aimag* hospitals functioning primarily as first-referral institutions. Mongolian national facilities provide the highest level of care in the country. It was within this environment in Mongolia in 2004 that the WHO IMEESC tool kits were field-tested and the training workshops were conducted. What has resulted is an integration of the WHO EESC program into the health care system, with promising results.<sup>5</sup> The WHO IMEESC tool kits have been implemented for first-level providers beyond the initial deployment at the 4 *aimag* provincial hospitals. There have been well-described improvements in education, training skills, and policy after EESC implementation. Health care facilities have incorporated the aseptic surgical technique, improved oxygen availability, provided standardized equipment for resuscitation, and reduced referrals as a result of access to procedural capabilities (ie, emergency surgery that is related to obstetrics, anesthesia, trauma, or pediatrics). Although the Mongolia experience warrants further analysis on specific outcome improvements, Mongolia's successful integration of the WHO EESC program and tools remains without dispute.

#### EFFECT OF WHO EESC PROGRAM ON HEALTH CARE DELIVERY AND FUTURE CHALLENGES

Indeed, gauging the effect of the WHO EESC program on the efficacy of health care delivery is one of the challenges moving forward, so efforts to monitor and evaluate the implementation of the WHO IMEESC tool kit for first-referral health facilities are under way. Although preliminary indications are positive, issues relating to scale-up need to be learned from previous efforts of collaborations with partners addressing the Millennium Development Goals 4 (reduce child mortality), 5 (improve maternal health), and 6 (combat HIV/AIDS, malaria, and other diseases). Indeed, there is a wealth of experience on introducing and scaling up public health interventions during the last 30 years. The implementation of cost-effective and evidence-based interventions such as the Control of Diarrheal Diseases and Acute Respiratory Infections, the Integrated Management of Childhood Illness, and the Integrated Management of Adolescent and Adult Illness have all shown impressive outcomes but also unexpected impediments in the process of going from



**Figure 3.** Covers of the English, Korean, and Mongolian translations of the surgical manual included in the World Health Organization Integrated Management for Emergency and Essential Surgical Care tool kit.<sup>4</sup>

an introductory phase to a larger scale effort (H. Troedsson, MD, and A. de Francisco, MD, PhD, MSc, unpublished data, March 2009).

With these lessons learned, the path forward for further development and implementation of the WHO EESC program is full of challenges. An important component for success is direct engagement of the surgeons, obstetricians, and anesthesiologists themselves, particularly because policy makers alone cannot prioritize surgical care and effect the necessary health systems infrastructure improvements. Accordingly, the WHO has established an organization of GIEESC stakeholders that collaborates and disseminates programmatic information through the official online collaboration center entitled MEDNET. For more information about the EESC program or to apply to become a GIEESC member, please visit <http://www.who.int/surgery>. Although the issues of surgical, obstetric, and anesthetic care have not historically been a priority for public health efforts or policy makers, with improved awareness and participation of the medical community, it is hoped that progress can be made.

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## REFERENCES

1. Weiser TG, Regenbogen SE, Thompson KD, et al. An estimation of the global volume of surgery: a modelling strategy based on available data. *Lancet*. 2008;372(9633):139-144.
2. United Nations Development Program (UNDP). Millennium development goals. UNDP Web site. <http://www.undp.org/mdg/>. Accessed April 6, 2010.
3. Debas HG, Gosselin R, McCord C, Thind A. Surgery. In: Jamison DT, Breman JG, Measham AR, eds, et al. *Disease Control Priorities in Developing Countries*. New York, NY: Oxford University Press, 2006:1254-1259.
4. World Health Organization (WHO). Emergency and essential surgical care. Integrated Management for Emergency and Essential Surgical Care (IMEESC) tool kit. WHO Web site. <http://www.who.int/surgery/publications/imeesc/en/index.html>. Accessed July 12, 2009.
5. Cherian MN, Noel L, Buyanjargal Y, Salik G. Essential emergency surgical, procedures in resource-limited facilities: a WHO workshop in Mongolia. *World Hosp Health Serv*. 2004;40(4):24-29.