LITERATURE

[1] Krcmery V.Jr. and Schnorrer M.: The role of the School of Health Care and Social Work at the Trnava University in health care education. *Bratisl Lek Listy* 1996; 97(11): 700-1.
[2] Bokesova-Uhrova M.: Scientific conference and bicentenial celebrations commemorating the establishment of a medical faculty at the Trnava University. *Bratisl Lek Listy* 1970; 53(3): 381.
[3] Duka N.: Murizio Fabi, the 1st graduate of the medical faculty at Trnava. The professional level of the faculty. *Bratisl Lek Listy* 1969; 52(5): 615-8.
[4] Simoncic J.: The diploma of surgeon from Trnava University. On the 350th anniversary of the opening of Trnava University. *Bratisl Lek Listy* 1986; 86(1): 101-3.
[5] Vojtova M.: 200 years since the establishment of the medical faculty at Trnava. *Cas Lek Cesk* 1970; 109(1): 22.
[6] Lozsadi K.: Medical instruction at the University Nagyszombat (1769-1777. *Orv Hetil* 2006; 147(20): 952-5.
[7] Magyar L.A.: Documents about the establishment of medical faculty at the University of Nagyszombat from 1769. *Orvostort Kozl* 1994; 40(3-4): 93-102.
[8] Szabadvary F. and Vamos E.: Lecturers in chemistry at the Medical Faculty of the University of Nagyszombat. *Orvostort Kozl*. 1994; 40(3-4): 45-54.
[9] Bugyi B.: Dissertations at Nagyszombat in 1775. *Orv Hetil* 1975; 116(48): 2846-7.
[10] Harko V.: The first medical lectures at the University of Nagyszombat, 1770. *Orv Hetil* 1975; 116(48): 2844-6.
[11] Duka Zolyomi N.: Foreign students of the Nagyszombat School of Medicine and the first graduate. *Orv Hetil* 1969; 110(44): 2589-91.
[12] Rippa B.K.: The importance of the medical faculty of the Nagyszombat School of Medicine in the 2d half of the 18th century. *Orv Hetil* 1968; 109(40): 2218-20.
[13] Halmai J.: Professor of Chemistry and Botany of the University of Nagyszombat (J'osef Jakab Winterl). *Orv Hetil* 1964; 105: 1613-5.
[14] Winterl J.J. and Halmai J.: Professor of Chemistry and Botany of the University of Nagyszombat (J'osef Jakab Winterl). *Orv Hetil* 1964; 105: 1613-5.
[15] Bitskey I. (ed.): Petrus Cardinalis Pázmany Archiepiscopus Strigoniensis Kardinál Peter Pázmaň, ostrihomský arcibiskup. 2010, V slovenskom preklade vydalo Vydavateľstvo Trnavskej univerzity: Trnava. 254.
[16] Šimončič J.: Úvod, in Dejiny Trnavskej univerzity 1635-1777, 1992-2010, J. Šimončič and A. Hološová, Editors. 2010, Typi Universitatis Tyrnaviensis: Trnava. p. 370.
[17] L'Africano C.: Delia Melancolia. 1959: Roma, Istituto di Storia della Medicina.
[18] Kopecký Š.: Lekárska fakulta 1769-1777, in Dejiny Trnavskej univerzity 1635-1777, 1992-2010, J. Šimončič and A. Hološová, Editors. 2010, Typi Universitatis Tyrnaviensis: Trnava. p. 370.
[19] Matoušek M.: První lékařská fakulta na Slovensku. *Časopis lékařú českých* 1936; 75(47): 1486-1487.
[20] Schweppe K.W.: Anton Storck und seine Bedeutung fur die Altere Wiener Schule. Zum 250. Geburtstag eines grossen Gelehrten und Klinikers. *Medizinhist J* 1982; 17(4): 342-56.
[21] Roszivalova-Lenzova E.: Václav Trnka z Křovíc, český profesor na Trnavské univerzite. *Časopis lékařú českých* 1950; 90(19): 559-560.
[22] Rozsívalová E.: Václav Trnka z Křovic, profesor na lékařské fakultě v Trnavě, Budíně a Pešti. *Jihočeský sborník historický* 1947. 16: 76.
[23] Duka-Zóllyomi N.: Absolventi Trnavskej lekárskej fakulty vo vede a praxi., in Z dejín vied a techniky Slovenska VI. 1972, Historický ústav SAV: Bratislava, Slovakia.
[24] Hegyi L.: Zdravotnícka reforma v Rakúskej monarchii. [cited 2011 23.08.]; Available from: http://www.bedekerzdravia.sk/?main=article&id=765.
[25] Sechel T.D.: The Emergence of the Medical Profession in Transylvania (1770-1848), in Cultural Dimensions of Elite Formation in Transylvania (1770–1950), V.K.a.B.Z. Török, Editor. 2008, Ethnocultural Diversity Research Center, EDRC Foundation, Cluj-Napoca. p. 280.
[26] Welie J.V.: Ignatius of Loyola on medical education. Or: Should today's Jesuits continue to run health sciences schools? *Early Sci Med* 2003; 8(1): 26-43.

ZLATICA ONDRUSOVÁ

Faculty of Health and Social Care, Trnava University, Trnava, Slovakia

# Maternal health and challenges of health care provided at the maternity ward of the Kibuye district hospital in Rwanda

## *Opieka nad matką i wyzwania związane z jej zapewnieniem na oddziale położniczym szpitala rejonowego w Kibuye w Rwandzie*

***Abstract:***

***Objective:*** *Present an overview from the author's perspective of the country's approach in tackling the problem of high maternal and neonatal mortality and the day to day challenges of practising medicine at the maternity ward of the Kibuye district hospital.*

***Background:*** *Rwanda, a sub-saharan African country, has one of the highest maternal and neonatal mortality rates in the world. The country's approach in reducing these figures is by means of the Millennium Development Goals initiative.*

***Method:*** *During a three month medical mission from December 2009 till March 2010, the day to day medical practice and working conditions were evaluated and counted towards the quality of health care provided to patients hospitalized at the maternity ward.*

***Conclusions:*** *Due to a lack of doctors, nurses, and other health professionals combined with difficult working conditions and a shortage of basic medical equipment, it continues to be a struggle to provide the best medical quality possible. In*

*order to fulfill the Millennium Development Goal 5 of reducing maternal mortality by three quarters by 2015, it will be important to increase the number of qualified health care professionals and equip the maternity ward with basic instruments and medications.*

***Streszczenie:***
***Cel:*** *Przedmiotem niniejszej pracy jest ogólna ocena oddziału położniczego szpitala rejonowego w Kibuye w Rwandzie. Ma ona na celu rozwiązanie problemu wysokiej śmiertelności matek i dzieci, który stanowi wyzwanie w codziennej praktyce lekarzy w tym kraju.*
***Wprowadzenie:*** *Rwanda jest krajem w środkowo-wschodniej Afryce, w którym występuje jeden z największych na świecie wskaźników śmiertelności matek i noworodków. Inicjatywą prowadzącą do poprawy tego stanu jest powołanie organizacji międzynarodowej Millennium Development Goals.*
***Metoda:*** *Podczas trzymiesięcznej misji (od grudnia 2009 do marca 2010 roku) oceniono codzienną praktykę medyczną, warunki jej sprawowania, oszacowano jakość opieki zdrowotnej nad matkami i dziećmi hospitalizowanymi w oddziale położniczym tego szpitala.*
***Wnioski:*** *Z powodu znacznego niedoboru lekarzy, pielęgniarek i innych pracowników służby zdrowia, którzy i tak pracują w trudnych warunkach oraz braku podstawowego wyposażenia medycznego, konieczne są aktywne działania mające na celu poprawę tej sytuacji.*
*Aby zrealizować podstawowy cel Millennium Development Goal, to jest zmniejszenie śmiertelności matek i dzieci o trzy czwarte w 2015 roku, konieczne jest zwiększenie liczby wykwalifikowanych pracowników służb medycznych i wyposażenie oddziałów położniczych w podstawowy sprzęt i leki niezbędne do ich działalności.*

***Keywords****: maternal health, health care, Rwanda*

***Słowa kluczowe****: zdrowie matki, opieka zdrowotna, Rwanda*

## Country profile

Rwanda is a sub-saharan central African country neighboring Uganda, the Democratic Republic of the Congo, Burundi and Tanzania. The population of Rwanda is estimated at 9.3 million inhabitants, with a surface area of 26 338 km$^2$ and an average density of 368 inhabitants/km$^2$. The total fertility rate is estimated at 5.5. Women are estimated to represent 52.2% of the population, with a life expectancy at birth of 53.3 years, compared to 49.4 years for men [1].

The country's socio-economic situation has been greatly influenced by the consequences of

the genocide. The incidence of poverty is still high, with 57% of the population living below the poverty line and 37% of them living in extreme poverty. However the annual per capita income increased from US$ 235 to US$ 291.3 between 2002 and 2008 [1].

## Health profile

Despite the progress made in the fight against diseases, the epidemiological profile of Rwanda is still dominated by communicable diseases, which constitute 90% of chief complaints in health facilities. Mortality and morbidity from these illnesses are aggravated by high levels of poverty, low levels of education as well as problems related to inadequate water, hygiene and sanitation systems. The most common communicable diseases are malaria, HIV/AIDS, acute respiratory infections, diarrhoeal diseases and tuberculosis.

Malaria is considered to be the primary cause of morbidity and mortality in Rwanda. However, according to the 2007 Annual Report by the Ministry of Health, morbidity, mortality and the specific lethality of malaria are on a sharp decline. Rwanda is experiencing a generalized HIV/AIDS epidemic, with a national prevalence estimated at 3% in the general population aged 15-49 years [4]. The prevalence of HIV reveals disparities between urban (7.3%) and rural (2.2%) areas, between women (3.6%) and men (2.3%). A survey on sero-surveillance of HIV infection per sentinel sites among pregnant women in prenatal consultation services conducted in 2007 showed a median prevalence of 4.3%. The prevalence of syphilis has reduced considerably among pregnant women, declining from 5.9% in 2005 to 2.4% in 2007. At the national level, 33% of women suffer from anaemia.

Micronutrient deficiency, mainly iodine, iron and vitamin A, affect pregnant women and children under the age of five in particular. The basic reasons for this situation are insufficient food rations, a high prevalence of infectious and parasitic diseases, poor dietary habits, very low levels of education and high levels of poverty [1].

✉ MUDr. Zlatica Ondrusová, PhD.,Trnavská Univerzita, Fakulta zdravotníctva a sociálnej práce
Univerzitné námestie 1, 917 01 Trnava 1,tel.: +421 904 147 177, e-mail: zlaticapeskova@hotmail.com

*Health system statistics*

According to World Health Statistics from 2004 there were only 401 physicians with a density of 0.047 per 1000 inhabitants. The number of practicing nurses totaled 3 593 and midwives, 54, with a density of 0.42 and 0.01 per 1000 [5]. These numbers show a very high shortage of health care professionals which in turn plays an important role in providing sufficient quality and quantity of care. Seventy-five percent of the population lives within 5 km of a health facility and the average coverage of hospitals is 190 000 inhabitants per hospital [1].

*Maternal Health*

The causes and trends of maternal mortality and morbidity of Rwanda closely follow the causes and trends at global and especially regional levels.

According to the World Health Organization (WHO, 2005), the number one killer of young women in developing countries is pregnancy and childbirth. One woman dies each minute (529 000 women per year) from pregnancy related complications. Furthermore, approximately 10 million women each year suffer injury, infection or disease due to pregnancy and childbirth [2].

Sub-Saharan Africa has the highest rates of maternal mortality in the world. At approximately 900 deaths per 100 000 live births. Globally, one of the most reliable predictors of the maternal mortality ratio is whether births are attended by skilled health professionals. The trend holds true in Africa where the main indirect cause for the high maternal mortality ratio is the low number of births attended by skilled health attendants. The leading direct cause of maternal death in Africa is hemorrhaging, accounting for 34 % of all maternal deaths (Figure 1.)[2].

However, the presence of a skilled birth attendant has been shown to reduce the incidence of postpartum hemorrhaging through active management in the third stage of labor with the administration of uterotonics. In turn, with the proper management of postpartum hemorrhaging there could be a reduction in maternal mortality rate. Access to proper maternal health services, therefore, has a strong impact on maternal health outcomes [2].

*Millennium Development Goal*

Rwanda's efforts to improve maternal health are defined in Millennium Development Goal 5. Its primary target is to:

- reduce by three quarters the maternal mortality ratio from 611 per 100 000 live births in 1990 to 153 per 100 000 by 2015
- increase the proportion of births attended by skilled health personnel by 2015

There has been some dynamic changes in maternal mortality rates over the last few years. The maternal mortality rate has fallen from 1 071 in 2000 to 750 per 100 000 births in 2005, a reduction of almost 30 % (Figure 2.).

Other achievements have also been made in maternal health in Rwanda such as a marked increase in assisted deliveries (Figure 3.) [2].

At least 2 767 women die from complications during pregnancy or delivery each year in Rwanda. The main causes include hemorrhaging, infection and infectious diseases. According to a study conducted in 2008 by the Rwanda Ministry of Health, Maternal and Child Health Unit, the main causes of maternal death among Rwandan women 15 to 49 years of age were hemorrhaging (46.1%) infection (15.5%) and malaria (15.4%) as shown in table 1. Surveys revealed that more than 75% of deaths could be prevented [2].

**Method:**

During the author's three month medical mission from 1 December 2009 till 2 March 2010, day to day medical practices and working conditions were evaluated and counted towards the quality of health care provided to patients hospitalized at the maternity ward. The author worked full time practicing medicine at the Kibuye district hospital in the western part of Rwanda. The most frequent medical cases were described.

**Results:**

*Hospital description*

Not only is the Kibuye district hospital responsible for providing medical care to the inhabitants of the city of Kibuye, but also to the inhabitants of the surrounding mountainous areas which are primarily covered by one of nine health centers. Due to a lack of doctors, only basic primary medical care is provided by practicing nurses at these health centers. Any complications or more serious cases are referred to Kibuye district hospital which is therefore responsible for an overall population of 147 000. The hospital has departments for internal medicine, surgery, pediatrics, maternity, psychiatry and inpatient care. There is an outpatient department that provides HIV/AIDS care and treatment, family planning and includes a general medicine referral office. There were only five full time Rwandan practicing doctors at the hospital at the time of the author's arrival. Planned surgeries were scheduled twice a week and were performed by a part time volunteer doctor. As the only doctor, the author became responsible for all the cases admitted to the maternity ward. Occasionally help was provided by another doctor in the event of simultaneous emergency operations.

**Health insurance and the hospital payment system**

Patients hospitalized, examined in any outpatient department and/or cared for at an inpatient level are fully responsible for all medical charges unless they have health insurance.

Medical charges include hospital stays, doctors' examinations, laboratory tests, medications and necessary medical equipment. Patients who have purchased health insurance pay only 10% of the original price. However due to high poverty, many patients do not have health insurance and struggle to pay for prescribed laboratory tests or medications. These patients who are not able to pay cannot be discharged unless they pay all hospital related charges. Their debts to the hospital therefore continue to build until their relatives provide enough money to pay them off.

**Maternity ward equipment**

A general lack of instruments and often vital medications was observed. The maternity ward was equipped with a simple ultrasound machine and a few basic instruments for episiotomies, sutures or other minor surgical procedures like dilatation and curettage. No operative forceps or equipment for vacuum assisted deliveries, cardio-tocographs for fetal heart rate and contraction assessments were present. The supply of non-drinking water was limited only to the delivery room. A running water supply for patients' hygiene was located off the maternity ward. A warm water supply for the hygiene of newborns was not available.

**Operating room and anesthesia**

Minor gynecological procedures like dilatation and curettage or manual lysis of placenta were performed using a short acting general intravenous Ketamine anesthesia. Other short acting general anesthetics were not available. All laparotomic operations were performed using Bupivacaine spinal anesthesia. In case of a necessary prolonged general anesthesia, Ketamin was used. The operating room was not equiped with a respiration machine so in the case of prolonged Ketamine anesthesia with respiration supression, a manual breathing mask was used.
All anesthesias were performed by skilled anesthesiology nurses as no anesthesiology doctor was present at the hospital. There are two operating rooms at the Kibuye hospital. There is no laparoscopy equipment therefore all these operations were performed by means of laparotomy. The spectrum of major gynaecology and obstetric related surgeries included cesarean sections, hysterectomies, laparotomies for ectopic pregnancies and tubal ligations, the latter were performed at the patient's request. Operations are performed by one doctor with the assistance of a surgery nurse or a maternity ward nurse in the case of a surgery nurse shortage. Some of these nurses have no previous experience assisting in laparotomies.

**Medical cases admitted to the maternity ward**

The maternity ward has a capacity of thirty-six beds. Patients with gynecological problems, pathologic pregnancy cases and obstetric cases were hospitalized at the ward. All the newborns were also hospitalized at the ward including premature newborns and newborns showing symptoms of fetal distress or other pathologies. Most admitted patients were women referred from one of the surrounding health centers due to a previous delivery by cesarean section. However due to a lack of information about the date of the last menstrual cycle and the inavailability of ultrasound examinations at the health centers, many patients from distant health centers were referred to hospital many weeks prior to the expected delivery date. On average there were up to three to four cesarean sections performed daily. Indications for cesarean section mostly included uterus cicatricus (previous delivery by cesarean section), cephalo-pelvic disproportion or fetal distress. Incidences of first trimester bleeding due to a spontaneous miscarriage which required dilatation and curettage were frequent. Numerous cases of second and third trimester miscarriage or delivery of macerated fetus mortus were observed. In all these cases syphilis screenings were positive. All patients admitted for delivery were screened for syphilis and HIV. HIV testing was performed using one of the different brands of quick tests and was free of charge for patients. Pregnant women with other medical problems often associated with fever were also hospitalized at the maternity ward. Most of them were patients who tested positive for malaria or typhoid fever. A few cases of coma due to the cerebral form of malaria or hypoglycemia were successfully treated. Minor cases presented symptoms of respiratory or urinary tract infections. Pathologic pregnancy cases comprised of patients with threatened abortions, threatened preterm labour, preeclampsia and several cases of acute intra-abdominal bleeding due to a ruptured ectopic pregnancy which required immediate surgical intervention.

**Challenges of health care provided to the maternity ward patients**

A lack of practicing nurses and, at certain times, their inadequate theoretical knowledge of care management contribute to the low medical care standards and unnecessarily high morbidity and mortality rates observed on the maternity ward. A patient's inability to pay for necessary medical equipment (intravenous fluids, urine catheters and others) and treatment dramatically increase the risk of maternal and neonatal morbidity and mortality due to the postponing of an emergency cesarean section

indicated by a threatened uterine rupture, fetal distress or other. A lack of sufficient medical, operating and technical equipment limits the quality and quantity of operations and other medical procedures performed at the Kibuye district hospital.

## Conclusions

Due to a lack of doctors, nurses, and other health professionals combined with difficult working conditions and a shortage of basic medical equipment, it continues to be a struggle to provide the best quality of medcial care possible. In order to fulfill Millennium Development Goal 5 of reducing maternal mortality by three quarters by 2015 it is important to increase the number of qualified health care professionals and equip the maternity ward with even the minimum basic instruments and medications.


## Acknowledgements

I wish to give thanks to all the doctors of Kibuye district hospital and the nurses from the maternity and surgery ward for the opportunity to work in unison with them during my stay in Rwanda. This article could never have been written without their acceptance. I admire their dedication and skilled practice in these difficult conditions.


LITERATURE


[1] WHO Country Cooperation Strategy 2009-2013, Rwanda http://www.afro.who.int/en/rwanda/country-cooperation-strategy.html [04.06.2010].

[2] Preventing Maternal and Child Deaths: Towards the MDGs 2015, Mothers and Neonatal Survival Conference Report, 2009 http://www.gwumc.edu/africa/pdf/MCH%20Conference%20Report.pdf [04.06.2010].

[3] Khan KS, Wojdyla D, Say L et al. WHO analysis of causes of maternal death: a systematic review. Lancet, 2006, 367:1066–1074.

[4] Government of Rwanda, Ministry of Health, National Institute of Statistics of Rwanda, 2006, Rwanda Demographic and Health Survey 2005, Calverton, Maryland, USA.

[5] World Health Statistics 2006, Country Health System fact sheet 2006, Rwanda http://www.who.int/whosis/en/ [04.06.2010] á E.: Psychology. Bratislava: Iris, 1999, 279 p., ISBN 80-8878-87-5.

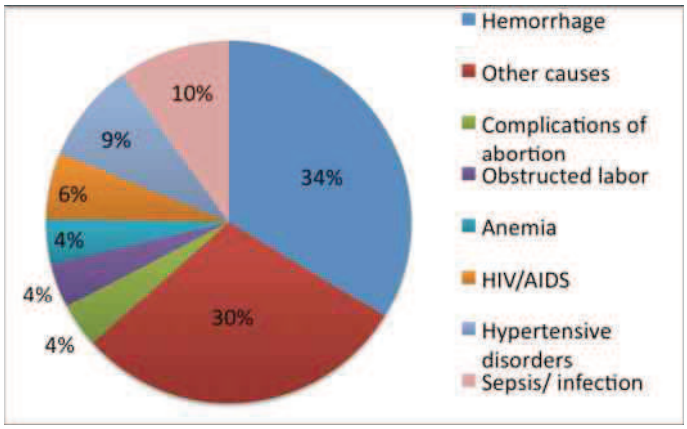




Fig. 1. Leading causes of maternal mortality in Africa [3]

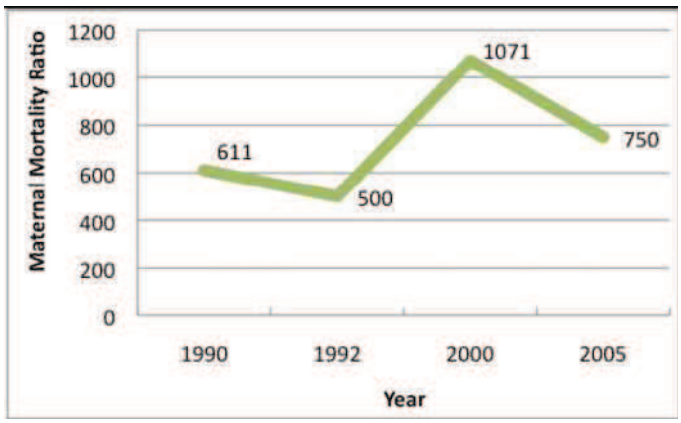
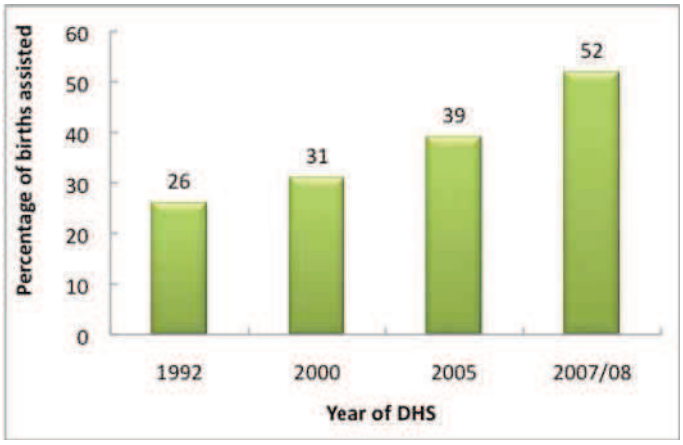



Fig. 2. Decrease of maternal deaths in Rwanda [4]




DHS * Demographic and Health Survey in Rwanda

Fig. 3. Assisted delivery in Rwanda [2]

Tab. 1. Main causes of maternal death in Rwanda [2]

| Causes of maternal death | Percent |
|---|---|
| Hemorrhage | 46.1 |
| Infection | 15.5 |
| Malaria | 15.4 |
| Eclampsia | 8.7 |
| Dystocy | 6.7 |
| Anesthesia | 3.8 |
| Cardiomyopathy | 2.9 |
| Acute pulmonary edema | 1.9 |