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CLINICAL ARTICLE

Improving maternal and perinatal health care in the Central Asian Republics

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ABSTRACT

Objective: To describe our experience of a complex training intervention to introduce effective perinatal care, evidence-based medicine, national confidential enquiries into maternal deaths, and facility-based near-miss case reviews in the Central Asian Republics. *Methods:* We describe our experiences from training sessions and report on findings from data extraction from patient records, patient interviews, discussions with healthcare staff, and observation of health care during our follow-up visits. *Results:* Many outdated practices in perinatal care have been abandoned, and several recommended approaches have been adopted in pilot facilities. Familiarity with the concept of evidence-based medicine has increased among participants. National confidential enquiries into maternal deaths are being prepared and facility-based near-miss case reviews piloted. *Conclusion:* The experience of the complex training intervention to improve maternal and perinatal health care in the Central Asian Republics is encouraging, but roll-out will be challenging. The quality of care and the attitudes of healthcare providers will have to be monitored continuously.
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1. Introduction

The Central Asian Republics (CARs) of Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan have well-developed healthcare systems, which were established when they were part of the Soviet Union. Numbers of hospital beds, physicians, and midwives per 100 000 population in the CARs are similar to or exceed those in the European Union (in 2004: 596 vs 578, 286 vs 321, 65 vs 36 per 100 000, respectively [1]). Staff are well trained to apply existing standards, and there are penalties for not doing so.

In the USSR, maternal and child health care (MCH) was an important area of competition with the West, but in the early 1980s the USSR stopped reporting mortality data, realizing that its achievements in the arms and space races were not replicated in the social sector [2]. MCH retained its priority in the CARs after independence, and MCH services became part of a benefits package when other services were no longer free at the point of delivery. Coverage of antenatal and delivery care exceeds 90% [3], except in Tajikistan, where it has fallen recently [4]. Nevertheless, the well-staffed and intensively used healthcare facilities do not deliver the expected output. In particular, during the economic transition, MCH indicators deteriorated [4,5]. Estimated maternal mortality ratios (MMRs) range from 24 to 210 per 100 000 live births [6,7], and perinatal mortality rates range from 39 to 57 per 1000 live births [8] (Table 1), compared with ratios of about 10 per 100 000 live births and 10 per 1000 live births, respectively, in Western Europe. Maternal and neonatal mortality are probably underestimated because the circumstances are disguised and non-standard definitions of neonatal mortality are applied. The WHO estimates that MMR is 2–4 times higher than officially reported [9]. Under Soviet rules a newborn had to fulfill several criteria in terms of breathing, duration of gestation, weight, and length to be counted as a “live birth,” and misreporting of neonatal mortality was reportedly widespread [10]. Several CARs have now adopted international live birth definitions and are reporting higher and more realistic numbers of neonatal deaths [11].

The Soviet system of quality control was based on ministerial standards for clinical managerial practice, which included statutory maternal and perinatal death reviews, aimed at punishing those who defaulted. This system has been maintained in the CARs. Detailed enquiries about maternal or perinatal deaths and punishment of “guilty” healthcare professionals are regarded as proof of the efficiency of the supervisors. Penalties of various degrees of severity, up to dismissal (despite a shortage of qualified staff in many regions), are imposed in all cases of maternal death, whether or not clinical management met reasonable standards. The prosecutor also undertakes enquiries into maternal deaths, which can lead to severe punishment including imprisonment. Healthcare staff are rarely involved in the analyses and usually miss the opportunities to learn from such experiences.

Countries are now accepting that the system needs to be reformed for the quality of care to improve [12]. The World Health Organization Regional Office for Europe and its partners are working on improving

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Table 1
Demographics of the Central Asian Republics.

Republic	Population (millions) [23]	Density (persons/sq km) [23]	GDP (per capita) (2006 est) [23]	MMR/100 000 (WHO est.)		PNM/1000 (WHO est.) 2006 [8]
				2000 [6]	2005 [7]	
Kazakhstan	15.2	5.6	$9400	210	140	57
Kyrgyzstan	5.3	26.5	$2100	110	150	57
Tajikistan	7.1	50.7	$1300	100	170	62
Turkmenistan	5.1	10.2	$8500	31	130	39
Uzbekistan	27.8	61.8	$2000	24	24	46

Abbreviations: GDP, gross domestic product; WHO est., World Health Organization estimate; MMR, maternal mortality ratio per 100 000 births; PNM, perinatal mortality rate per 1000 births.

maternal and perinatal health in the CARs [13]. The authors were personally involved throughout this process. The first 4 years' experience of this undertaking and our reflections as first-hand observers are described here to help those planning similar work in other specialties but comparable settings.

2. Materials and methods

The interventions started with the regional WHO initiative “Promoting Effective Perinatal Care (EPC)”, which is now streamlined in the global WHO “Making Pregnancy Safer” program. Planning meetings at the national level introduced WHO recommendations to the CARs and were followed by national training courses. Participants included neonatologists, neonatal nurses, midwives, obstetrician/gynecologists, health administrators, infection control specialists, and representatives of the Ministry of Health and academic institutions. The objectives were to enhance the knowledge, skills, practices, and attitudes of perinatal caregivers in line with international standards and to ensure evidence-based clinical management. Participants, who were invited to compare current practice with WHO recommendations, realized the gap between current and best practice. They recommended a number of activities, for example developing national clinical guidelines, updating legislation, and abandoning outdated clinical practices. EPC training at regional and district level followed, which included a practical component: in pilot facilities, participants practiced clinical management during labor and delivery according to WHO recommendations, equipped delivery rooms with Ambu bags, essential drugs, heaters etc. and made them look and feel less like surgical theatres and more like home.

Health professionals in the CARs lack up-to-date knowledge and an appropriate background in epidemiology, which is a constraint in making clinical guidelines. Workshops on “Evidence-based mother and newborn care” targeted top-level clinicians and provided them with the concept of evidence-based medicine (EBM), and with skills critically to appraise studies; key papers, including Cochrane reviews, were translated into Russian. The EBM concept was discussed, because clinical practice requires different levels of evidence to answer questions that arise. Participants considered the principles of guideline development and the scientific basis to different approaches for changing professional and organizational attitudes and practices. Principles and practice of literature search and review were covered, focusing on PubMed, Cochrane, and the WHO Reproductive Health Library.

In 2004, WHO launched “Beyond the Numbers” (BTN), a collection of methods “to elucidate the underlying causes of maternal deaths [and cases of near-miss morbidity] and [to] identify what could be done to avert them” [14]. Regular quality assurance activities are seen as important to ensure that principles of evidence-based care are followed in a sustainable way [15]. Two BTN methods were identified as particularly promising in the CARs. The first method was “Confidential Enquiries into Maternal Deaths,” which has been developed in the United Kingdom since 1952: all maternal deaths are investigated by a national expert team, taking community and health facility factors into account; data are strictly confidential and are used to produce recommendations to policy makers [16]. The second method was “Facility-Based Near-Miss Reviews”: hospital teams meet on a regular, for example monthly, basis and analyze the management of a life-threatening obstetric complication to identify options for improvement [17]. The WHO Regional Office for Europe invited top level professionals from all CARs to attend regional BTN workshops in 2004 and 2005. Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan adopted BTN: on national workshops, the overall strategy was agreed, while details of implementation were elaborated on technical workshops.

The interventions were evaluated in various ways. For EPC, data extraction from patient records and patient interviews were conducted before and after the intervention. For EBM, participants indicated their level of understanding of relevant concepts such as “sensitivity/specificity,” “randomized controlled trial,” and “systematic review” on a scale from 1 to 5 before and after the training; new guidelines were compared with existing guidelines using the domains of the AGREE instrument [18] (scope and purpose, stakeholder involvement, rigor of development, clarity of presentation, applicability, and editorial independence). For all interventions, WHO expert teams, including the authors, visited pilot hospitals in the CARs to inspect the facilities, analyze patient records, discuss with healthcare staff, and observe health care being delivered to patients.

As this study does not report on research activities in the strict sense but on observations, informal discussions, and experiences during and after our training interventions in the CARs, we did not need or seek ethics approval from our Institutional Review Boards.

3. Results

In all 4 CARs that embarked on the process, we observed a willingness to discuss openly during the workshops the shortcomings of the current system. Participants described how the circumstances of maternal deaths are concealed by falsifying medical documentation: “The case records always look excellent. They never write sepsis or hemorrhagic shock into the records. And yet, the woman dies.” Or by deflecting attention to remote colleagues who have played at best a peripheral role: “We always tried to find a responsible person as far away from us as possible, and who would that be? The doctor in the antenatal clinic. Like, a smear was not done in month 6 and that was then responsible for the death due to placenta previa.” Participants reported that health authorities participate in this cover-up and are themselves under pressure to report continuously decreasing maternal and child mortality to demonstrate improving quality of health care and effective local or regional administration. Participants expressed their frustration about the injustice engrained in the system: “It's always the doctors who are punished, never the administrators, even if it's them who fail to provide the necessary working conditions. And often it's the doctors who work hardest.” In summary, they felt: “Unless we get rid of this system of prosecution and punishment, we will not make any progress.”

After the EBM training, participants showed increased familiarity with relevant concepts; the mean self-assessment score improved

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by more than 1.0 for "literature search," "systematic review," and "sensitivity/specificity." Some CARs developed and started implementing national, evidence-based protocols and standards. In Kyrgyzstan, Tajikistan, and Uzbekistan, national algorithms on management of pre-eclampsia/eclampsia, sepsis, and postpartum hemorrhage were developed based on WHO guidelines; Kyrgyzstan also adopted new, evidence-based protocols for antenatal care, and the management of normal labor and delivery. The pre-training version of certain Kyrgyzstan national guidelines had very low AGREE scores, whereas recommendations in the final version were supported by evidence, and their presentation was much clearer.

When we visited facilities after EPC training, we found many outdated practices being abandoned, such as routine episiotomies, enemas, pubic shaving, directed pushing in the lithotomic position, the application of ice packs to prevent postpartum hemorrhage, and tight swaddling of the newborn. Several approaches recommended by the WHO were adopted: we found an increased frequency and quality of partogram use, excellent management of pre-eclampsia, active management of the third stage of labor, more frequent and more intense companionship and support during labor, individual delivery rooms, early skin-to-skin contact, rooming-in, exclusive breastfeeding, and free postpartum visits. In Kyrgyzstan, active management of the third stage of labor increased from 52% to 90% ($P<0.001$), whereas postpartum hemorrhage decreased from 2.9% to 1.3% ($P=0.056$); newborn hypothermia decreased from 28.5% to 1.1% ($P<0.001$) [19]. Persistent problems were inappropriate drug use (for example intravenous prostaglandins for cervical ripening, papaverin or atropin to facilitate opening of the cervix, and protein extract of calf blood to treat fetal growth restriction), limited choice of position—predominantly lithotomic—during the second stage of labor, insufficient warm chain for newborns, and the midwives' role in normal deliveries being limited to giving injections and monitoring blood pressure, uterine contractions, and fetal heart action but without the right to take decisions.

After the BTN workshops, politicians adapted the legal environment and in Kazakhstan and Kyrgyzstan agreed to a moratorium on punishments after maternal deaths. The implementation of confidential enquiries at national level and near-miss case reviews in 4–5 maternity hospitals per country has begun. In Uzbekistan, reviewers observed and received reports from healthcare workers about progress in adopting a no-blame no-punishment attitude and in issuing and implementing key recommendations to improve quality of care. Recommendations for strengthening the BTN process and plans to roll out case reviews to other hospitals were developed. Similar reviews have been initiated in the other CARs, and a multicountry review of lessons learned is planned for 2010.

On many occasions we have perceived enthusiasm and a willingness to make change happen. As one workshop participant commented: "We are gradually changing our psychology."

4. Discussion

The intervention described above is complex, and so is the Central Asian environment. Difficulties in the CARs are partially explained by the crisis of transition. With the erosion of free services during the 1990s, informal payment increased drastically and constituted 52% of the total health expenditure in 2004—3 times the proportion in the EU [1]. Government spending continues to focus on hospital care: in Tajikistan and Kazakhstan over 70% of the public health budget is channeled into hospitals [20]. Medical staff salaries are very low and differentials have emerged between the southern CARs and Kazakhstan, and between Kazakhstan and Russia, where doctors' salaries are lower than the national average at US$ 400 per month [21] versus US$ 560 per month [22]. This creates low morale and migration of healthcare workers. Nevertheless, even within existing resources better quality of care could be achieved [2].

A crucial issue concerning quality of care in the CARs is the nature of medical knowledge during communist rule. The political environment was hostile to changes that were occurring in the West, including the trend toward EBM. Limited access to English-language literature exacerbated the information vacuum. In research, there was rejection of experimental methods, limited knowledge of clinical epidemiology, lack of peer-reviewed papers, and an extremely hierarchical academic structure [20]. Consequently maternal health care in the CARs abounds with practices without evidence of effectiveness, whereas effective low-cost interventions—such as the partogram, active management of the third stage of labor, frequent hand washing, rooming-in, and exclusive breastfeeding—are not fully implemented. Standard setting was a top-down process led by a few opinion leaders, often not taking into account valid evidence of effectiveness, but imposing obsolete "infection control" practices like regular closure of wards for "disinfection" and repainting. Younger providers are now aware of EBM and oppose "eminence-based" medicine, which leads to conflict with older providers. However, today's generation of providers appears to be ready for change: we found that EBM training in Moldova, another ex-Soviet country, improved the quality of national guidelines, and AGREE scores increased in all 6 domains, particularly in "rigor of development" and "clarity of presentation."

With respect to BTN, the challenge is to replace a well-established but dysfunctional ex-Soviet quality control system by a system that looks similar but has different objectives and mechanisms. Unlike Soviet maternal death reviews, BTN methods are supportive, not punitive. They depend on frank discussion of weaknesses in case management; professionals who speak out are not threatened with disciplinary action or criminalization. Confidential enquiries into maternal deaths are the most comprehensive BTN approach and a "gold standard" for systematic investigation of maternal deaths. As a national operation they are logistically demanding and require changes in the legal framework in the CARs, where the investigation of maternal deaths is the duty and privilege of the prosecutor. It might also be difficult to convince those in authority that confidential enquiries are more effective than the existing system. Near-miss case reviews can start as a small-scale pilot activity. As a "grass roots" activity they empower local staff including midwives, who did not play an active role in Soviet-style reviews. No deaths are involved, and no changes in the legal framework are required. Because the women have survived, their perspectives on the care they have received can be taken into account. For the same reason there is always something to applaud, making it easier for team members to open up, discuss frankly, and avoid blaming one another. The strategy to start with near-miss case reviews and to delay confidential enquiries until the context is ready for them appears to be wise.

Several factors have facilitated the implementation of the interventions. The WHO was well respected by Soviet health authorities; this tradition continued after independence and helped to implement WHO recommendations in the CARs. Workshop facilitators were not only technically knowledgeable but also represented both Western and Soviet backgrounds and could speak from experience about overcoming barriers in both systems. Workshops involved clinicians, managers, and politicians, and allowed sufficient time (4 days or longer) for participants to adjust their thinking. Linking up with partner organizations, for example United Nations Children's Fund (UNICEF), United Nations Population Fund (UNFPA), and United States Agency for International Development (USAID), who now also promote EPC, EBM, and BTN training, has been successful. The implementation of BTN profited from the fact that EPC and EBM activities had been running for some time when BTN was introduced. Healthcare workers were thus well prepared to compare actual case management with evidence-based standards.

In future, sufficient resources should be allocated to a more thorough evaluation, as some components such as BTN are of unclear effectiveness, whereas other components, such as EBM training, have been evaluated in different contexts. Even if ideal designs are beyond

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reach, a more systematic, comprehensive, and objective evaluation should be achievable. Because introducing new methods of case review is about changing clinicians' practice, future interventions would benefit from research on what works and what does not work in making change happen. Introducing BTN into an environment with a long tradition of prosecution and punishment has its risks. Social science research should accompany the process so that adverse effects are detected and mitigated swiftly. The role of professional educational institutions in sustainably equipping the emerging workforce with skills to conduct valid case reviews in the context of quality assurance needs to be explored further.

In conclusion, the introduction of EPC, EBM, and BTN in the CARs, albeit well underway and greeted with enthusiasm, will remain a challenge, particularly when scaling up from well-informed, strongly motivated pilot sites to average facilities. It must be accompanied by monitoring and evaluation activities that assess changes in quality of care, healthcare utilization, attitude of healthcare workers, and their communication with patients and among themselves.

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Conflict of Interest

MB, SH, and JD have been working as consultants for the WHO Regional Office for Europe. AB and VB are employed by WHO Regional Office for Europe.

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