



Healthcare Providers and Women Perspective on Barriers in Post Abortion Contraception Care in Pakistan

1. Razia Naveed
2. Dr. Saima Hamid
3. Jawad Khan, PhD

Received 23th Apr 2022,
Accepted 25th May 2022,
Online 18th Jun 2022

¹ Quaid-i-Azam University, Health Services Academy Islamabad, Pakistan
razianaveed@gmail.com

² Fatima Jinnah Women University Rawalpindi, Pakistan

³ Applied Economics, School of Economics and Finance, Xi'an Jiaotong University China
jawadmarwat47@gmail.com

Abstract: Background: In Pakistan, the higher unmet need for contraception (20%) and low prevalence of contraceptives (35%) contributes towards unintended pregnancies. Post-abortion contraception provides an opportunity to decrease incidence rate of unintended pregnancies and breaking the chain of repeated induced abortions. The aim of the study was to improve maternal health by reducing unintended pregnancies ending in abortion by expanding post abortion contraception provision and care.

Methodology: An exploratory study was conducted in public sector health facilities and peri-urban communities of Islamabad. The study followed a qualitative approach to explore barriers faced by women and health providers in post-abortion contraception care. Purposive and snowball sampling methods were used. In-depth interviews (IDI's) and focused group discussions (FGD's) were conducted to collect data. Thematic content analysis was used for data analysis

Results: The main theme identified was, "Post-Abortion Care (PAC) failure in tertiary care public hospital in capital, Islamabad". The sub themes contributing to the main theme were perceptions of induced abortion and post-abortion care (package), social barriers to PAC and failure of healthy pregnancy and spacing.

Conclusion: There is pressing need of policy formulation regarding post-abortion care to reduce unintended pregnancies by providing effective and timely post-abortion contraception to women.

Keywords: Healthcare; Women; Barriers, Post-Abortion; Pakistan.

1. Introduction

Post-abortion contraception is defined as, “provision of contraception counselling and services at the time of or immediately after induced or incomplete abortion” (WHO 2012). Abortion can be both spontaneous and induced. Spontaneous abortion (miscarriages) is, "termination of pregnancy without deliberate measures; while induced abortion is using deliberate measures to terminate pregnancy" (WHO 1994). In this study induced abortion, will be used interchangeably with ‘abortion’. Post-abortion contraception is an important component of Post Abortion Care (PAC) model (Corbett 2003). Post-abortion contraception provides an opportunity to decrease incidence of unintended pregnancies and to break the chain of repeated abortions. Hence, it facilitates women to plan child births subsequently by receiving post abortion contraception at the time of post abortion care (Corbett 2003). High levels of unintended pregnancies lead to unsafe abortions which result in high maternal morbidity and mortality globally. Each year about 42 million pregnancies culminate in abortions worldwide; half of them end up in unsafe abortions. Developing countries share 95% of unsafe abortions that occur globally (WHO 2012 & 2013).

In Pakistan, higher unmet need for contraception (20%) and low prevalence of contraceptives (35%) contributes towards unintended pregnancies (Sathar, et al., 2013). According to National study on Induced abortion conducted by Population Council, approximately 9 million pregnancies occurred in Pakistan in 2012; about 46% were unintended and nearly 54% ended up in abortions (Sathar et al., 2014). Post-abortion contraception has robust impact on reducing repeated abortions due to unintended pregnancies. A prospective cohort study from northern Europe showed strong association of post abortion contraception and decreased repeated abortions among women. The association was stronger when long term reversible contraceptives were used (Heikinheimo, O., Gissler, M. and Suhonen, S., 2008). Similar findings were reported in Russia, where decreased incidence of induced abortions was observed when clients were provided with post abortion contraception and counselling (Curtis, 2010).

In 2001, the global evaluation on post abortion care revealed that post abortion contraception was not practiced much compared to treatment of abortions (Wang, et al., 2016). There are numerous barriers in post-abortion contraception use and compliance. These are described as, family and community barriers, barriers from women’s perspective, health facility level barriers, and barriers related to state policies, and practices (National Institute of Population Studies Pakistan 2012). In Pakistan women are not empowered to have their own reproductive health decisions. Husband and family members are key decision makers about contraception use, woman’s number of children, spacing and other fertility choices (Sathar et al., 2014). Other factors include non-availability of contraceptive, fear of side effects or contraceptive failure leading to unintended pregnancies (Saleem, S. and Fikree, F.F., 2001). Health care providers play an important role in PAC provision and uptake of such services. Quality PAC averts chances of maternal deaths from unsafe abortions and provide window of opportunity for preventing unintended pregnancies (Paul, et al., 2014).

National study on post-abortion care in Pakistan (2012) revealed that forty percent 40% of doctors had negative attitude towards patients with induced abortion and 30% refused to provide care to these clients (Sathar et al., 2014). The study further identified various barriers such as inadequate staffing, lack of skilled health care workers, lack of necessary commodities to provide post-abortion care (Sathar et al., 2014), (Arambepola, 2014). In Uganda, health care providers had judgmental behavior towards patients with induced abortions thus affecting quality of care (Paul, et al., 2014).

Evidence from research from Scotland conducted by Purcell et al., (2015) showed that proper and timely counselling and provision of contraceptive is challenging due to lack of sufficient time and trained personnel at the time of abortion care (Purcell et al., 2016).

The stagnant CPR (35%) in Pakistan shows the barrier in family planning services use in Pakistan. Post abortion contraception doubles the barriers in accessing and use of contraceptive following an abortion as abortion is stigmatized subject in our society today. Socio-ecological model (Fig. 1) was used as a guide in the study to explore the barriers women and healthcare providers face at individual, family, community, and broader societal levels.

2. Data Methodology

Sampling & Data Collection Technique

Before data collection was started, report was built by visiting the facilities and contacting healthcare providers in the selected departments. Focal persons were identified from among the hospital staff i.e., those nurses available during morning and evening shifts and willing to participate in the study were requested to inform the researcher about induced abortion cases visiting the facilities. Focal persons from the private hospital did not report any such clients during the study period. During the study period only four patients with induced abortions were interviewed from the public sector hospital. As a result, the research team decided to recruit participants from peri-urban communities of Islamabad. The rationale behind this selection of the area was based on the profile of the four clients seen at the hospital who came for PAC services i.e., women from low-socio economic background and with low education and high parity.

Key informants (domestic workers) were identified from two communities and through them married women having experienced induced abortions in the recent past were invited for in-depth interviews.

Purposive and snowball sampling was used to identify women with induced abortion experience and women seeking post abortion care in the communities and at the facilities (detail given in data collection technique). Healthcare providers were selected purposively who were involved in post abortion care and contraceptive provision services. 15 In-depth interviews (IDI's) and 3 focused group discussions (FGDs) were conducted till saturation level was achieved. IDI's were conducted with women and FGD's were conducted to collect data from health care providers.

In-depth interview guide was used to collect data. The guide contained open-ended questions covering domains of PAC components i.e., barriers women faced in post abortion contraception access, uptake, and use. Further, the guide also consisted of the expectations of women related to post abortion contraception information and services. The guide was translated into Urdu. Each IDI ended within half an hour time with each woman in the health facility and in the communities. Interviews were conducted from women in the public health facility as well. Due to sensitive nature of the study topic and confidentiality concerns of participants, women identified in the communities only agreed to be interviewed over phone. IDI's were tape recorded with permission of the participants. Verbal consent was taken from all participants.

Three FGDs were conducted with the healthcare providers. There were 5-8 persons in each FGD. FGDs helped to explore the barriers in post abortion contraception service delivery, supply, availability of different contraceptive commodities and availability of trained staff in counselling for post abortion contraceptive provision. FGDs were tape recorded with the written consent of study participants.

Data Analysis

Thematic content analysis was used for data analysis. IDI's and FGD's were transcribed soon and translated into English. All transcripts were read several times for initial coding and theme identification. After re-reading the transcription, data was grouped into different codes. From the codes sub-themes and themes identified.

Ethical Considerations

Ethical approval was taken from the Ethical Research committee of Health Services Academy. Written informed consent was taken from health care providers and verbal consent from women. Permission was sought from PIMS administration and department heads of gynaecology and MCH centre. Approval was taken from Rawal General Hospital administration and head of Obstetrics & Gynaecology department. All information related to research individuals was kept highly confidential in password protected files.

3. Empirical Results

Fifteen women of childbearing age were interviewed. Thirteen women had induced abortion once and two had more than one induced abortion in the last two years. The mean age was 31 years (± 5.667 SD) with average 4.27 children (± 1.870 SD). Majority of the women had primary education. Their average monthly household income was about PKR.15, 000. The socio-demographic characteristics are shown in (table 1).

Table 1. Socio-Demographic Characteristics of Women

Variables	Percentage (%)
Education	
Uneducated	33.3%
Primary	33%
Metric	26.7%
Intermediate	7%
Occupation	
Housewives	53.3%
Domestic workers	46.7%
Induced abortions	
One-time	86.7%
Two times	13.2%
Husband's Occupation	
Private Servants	53.3%
Labour	20%
Govt. Servants	20%
Unemployed	6.7%
Household Headship	
Husband	66.7%
Other	33.3%
Family Type	
Extended family	53.3%
Nuclear family	46.7%
Marital Duration	
6-10 Years	60%
>10 years	40%
Monthly Income	
PKR < 15,000/-	40%
PKR 15,000-25,000/-	46.7%
PKR >25,000/-	13.3%
Religion	
Muslim	66.7%
Non-Muslim	33.3%

Three FGDs were conducted with doctors, nurses, midwives, and family welfare technicians at MCH centre, gynaecology emergency and gynaecology ward of PIMS Islamabad. FGD participants included two family welfare workers, one OT technician, one OT nurse, five medical officers, four charge nurses and five clinical nurses. All the health providers had more than two years of experience in patient care. The main theme identified was, “Failure of Post-Abortion Care Service delivery at Public Tertiary Care Health Facility”. The sub themes contributing to the main theme were perceptions of induced abortion and post-abortion care (package), social barriers to PAC and failure of healthy pregnancy and spacing.



Figure 1: Conceptual Framework

Failure of Post-abortion Care Service delivery at public tertiary care health facility

The main public sector tertiary care health facility failed to provide post-abortion care to its clients. It was evident by the barriers faced by both women and health providers. Low presentation of women to the facility, lack of PAC policy, deficiency of specialized set up with adequate and well-trained staffing and lack of coordination between concerned departments were highlighted by participants as contributing factors towards failure of post-abortion care in the facility. Majority of women mentioned that they availed services for abortion and post-abortion care services from private facilities due to lack of dignified post-abortion care services from public facilities.

1. Perceptions of induced abortion and post-abortion care (package).

The sub-theme consists of overall understanding of abortion and post-abortion care package among health providers. The categories under the sub-theme would include causes and consequences of abortion, awareness of PAC and its components among health providers.

1.1. causes and consequences of induced abortion:

Majority of the health care providers were aware of the causes and consequences of abortion. According to the views of health providers, induced abortions occur generally because of social pressures. Female sex detection through ultrasonography, multi-parity because of non-use of contraception and family pressure to conceive repeatedly were some of the reasons shared by the respondents. Multi-parity, poverty, and unintended pregnancy because of unwillingness to use contraceptives due to fear of side effects and lack of awareness of different contraceptive choices were identified causes of abortion. Apart from husband/family opposition, religious misperceptions of contraceptive use were cited by both healthcare providers and women as causes of abortion.

Firstly, having too many children is the reason of induced abortion. Secondly, poverty is another factor as affordability is an issue. Thirdly women avoid using oral pills due to fear of developing diseases like heart disease. Above all being uneducated is an important reason as they won't understand either oral pills or family planning and pregnancy and they lack understanding of risks of abortion. They end up in abortion due to ignorance. Our circumstances were such that if we had given birth to the child, we couldn't have gone out and worked so how could we have continued to earn money? So, we did abortion due to situation. Respondent sister told to stop using condom/Sathi as it causes swelling and bloating. She told me to sit immediately after having sex and do ablution, so conception won't happen. Now we regret (of using sister method) and won't try this method again. We have already taken three/four packets from here. Consequences of abortion were narrated by healthcare providers in terms of maternal morbidity and mortality. Majority of the health providers considered abortion a life-threatening condition due to risk of heavy bleeding and infection. Moreover, infertility was highlighted because of induced abortion. Depression and feeling of loss were mentioned as psychological consequences of abortion among women.

Abortion is a life-threatening condition where patient's life is at stake. Once it gets septic, it has worse effects on the patient. Other than this abortion is more painful and stressful for the patient than normal delivery. We must counsel the family as well that abortion is more stressful condition for a mother than normal delivery. Vaginal delivery is a natural process but in induced abortion sometimes leads to infection because of small pieces that may remain inside Uterus. That is why proper diet and medication are necessary along with prevention of post-natal psychosis, because at the time of abortion she alone is feeling the loss and grief, so we have to counsel the family to support.

1.2. Awareness of PAC and its components:

Awareness of PAC (Post Abortion Care) and its components was poor among health providers. None of the health providers were aware of detailed post-abortion care (PAC) package and its five components. All of them knew just two or three components of PAC. We counsel the patient regarding diet and tell her to take care of herself so she should not end up in sepsis. We also counsel the family to keep the patient away from stress. We counsel her regarding post abortion contraception use and inform her that she should use contraceptive. She must keep proper spacing to have another baby so that she can restore her health. The main emphasis was on treatment, partly on counselling by health providers. Few of them talked about post-abortion contraception. None of the healthcare providers knew about the other two important components of PAC i.e., community & service provider partnership and Reproductive health & other services. The patient with abortion is advised to maintain personal hygiene, take SITZ bath, and avoid contact (Sexual) with husbands for at least ten days because there are high chances of another pregnancy. Then we tell them about multivitamins, calcium

tablets and anti-anemic to avoid deficiencies. After that we tell her to join nearest family planning center and regularly follow their advice.

2. Social Barriers To PAC

The social barriers identified in the study had influence on all five components of post-abortion care namely, treatment, family planning services, counselling, community & service provider partnership and RH (Reproductive Health) & other services. Treatment of women seeking post-abortion care at PIMS were inadequate. It was evident that the facility had very limited post abortion care provision. Hence safe abortion services were also not provided in the facility; therefore, women were forced to go for unsafe abortions from clandestine environment by unspecialized personnel. Here usually legal couples come to us with bleeding, and we do their induced abortion but if they are not bleeding, we do not do abortion by ourselves”.

The barriers identified from health care providers were personal beliefs and negative behaviours towards induced abortion. Majority of the healthcare providers believed abortion as a sin, forbidden act (haram) and wrong practice and it should be discouraged. Well, induced abortion is criminal abortion, and it is forbidden in Islam. Patients should be counselled well to understand that it is a sinful act and should not be committed. It is fine to have children as Allah is providing sustenance to them. Our holy book declares abortion as a sin. Being Christian, it is written in our Ten Commandments and Sharia of Musa (Pbuh) that “do not murder”. Basically, we do not want to murder anyone. We believe that the life within the belly should come to this world whether legal or illegal.

2.1. Family planning, contraceptives services and counselling

It comprised of providing contraceptive services to reduce abortions due to unintended pregnancies. Pertaining to contraceptive services following an abortion, health providers agreed that non-compliance of follow up visit of women due to family pressures lead to non-use of post-abortion contraception. Patients do not come to us for follow up visits. We ask them to revisit for family planning session after abortion but when they go back home, family pressure and husbands discourage them to turn up for follow up visit by saying that what has happened, has happened (Jo hogia so hogia), so what is the need of going back for contraception. Furthermore, husband’s unwillingness to use contraception and mother-in-law’s desire to produce more children leads to non-usage or discontinuation of post-abortion contraception. One case happened that there was a woman who came back to us just after 15 minutes to remove IUCD. Though she was satisfied with it without any fear, but her sister-in-law called her husband on their way back and he forced her to go back and remove it. This kind of things happens.

Moreover, fear of side effects and lack of contraceptive knowledge among women were highlighted barriers to non-use or discontinuation of post-abortion contraception. Even if they take contraceptives from here, they still discuss it with neighbours and other people which create fear in their heart. We must have a proper place for counselling and education and if they don’t want to have unwanted child, they should take advice from here and adopt family planning methods as early as possible to avoid life threatening situation. Patients come to us with worse conditions. They come to us after inducing abortion. They are found in serious shock or life-threatening conditions. At that time due to shortage of staffing, we are unable to counsel their family. We lack proper counselling room to sit with the family and husband to counsel properly. In antenatal time we lack resources for proper counselling. There is no reason that any family will deny using contraceptives, it’s impossible. The only thing we lack is proper counselling and inability to convince them for post-abortion contraception

Accessibility of contraceptives in terms of affordability and social accessibility were emphasized both by women and health care provides as a barrier to contraceptive use and compliance. The women reported that husbands and families especially mother-in-law plays an important part in seeking care

after an abortion. Therefore, social accessibility to seek care for abortion or follow-up for post-abortion contraception was very challenging for women. It was mentioned by the health care providers that patients do not turn up for follow-up visit after abortion. Hence it declines the usage of post-abortion contraception.

2.1.1. Expectations of women related to post abortion contraception

The expectations of women regarding post abortion contraception were highlighted in terms of provision of information and counselling. The women said that they must be provided complete information and post abortion contraception counselling along with their husbands. But unfortunately, the patients were either provided incomplete information or poor counselling or they were not provided any information and counselling at all. They must counsel us along husbands and provide information regarding all the methods of contraception following an abortion like IUCD, permanent methods. They are not doing anything. They are not providing any information. We were not given any information regarding cleaning of Uterus, its reasons, about family planning methods, nothing.”

One patient who was admitted with post-abortion complication mentioned that she was informed that the doctor was going to insert capsule in her arm for contraception. But she was not given complete information on other methods of contraception so that she could make an informed choice. The doctor came and told our respondents that they will place a capsule in our arm for contraception. We were not provided any other information.

3. Failure of healthy timing & spacing of pregnancies:

Healthy timing and spacing of pregnancy (HTSP) are,” an intervention to family planning that helps women and families delay, space, or limit their pregnancies to achieve the healthiest outcomes for women, new-borns, infants, and children. HTSP aiming at providing free and informed contraceptive choices to attain desired family size in three different categories namely, after a live birth, after a miscarriage or abortion and for adolescents. There was failure of HTSP main messages and approaches regarding FP use for at least two years before next pregnancy after a live birth. Other than that, following a miscarriage or abortion, use of FP method of their choice for at least six months before next pregnancy was not practiced. There was lack of counselling of husbands and family along with women about FP methods and choices in post-abortion care. The failure was evident in the form of lack of knowledge of contraception among women.

3.1. Poor Implementation Of PAC:

Post-abortion care was poorly implemented in the public health facility. It was evident from the non-existence of specialized set-up for post-abortion care, lack of policy and Standard Operating Procedures for Post-abortion care, deficiency of counselling skills due to inadequate training of staff and high workload due to shortage of gynaecology nurses. Other administrative and policy barriers mentioned by health care providers were lack of coordination between gynaecology department, family planning unit and other concerned departments due to lack of clear policy of PAC. Additionally, physical accessibility of Family planning unit was another highlighted barrier. Following are the quotations from healthcare providers. One thing is that if family planning unit is near or within our ward, we can have easy access and let the patients know. Another reason is shortage of staffing because of which we don't get enough time to educate patient. If family planning unit will be within general ward like nursery, we can easily refer patient to the family planning centre for contraceptives access and use. Now in practice we inform them about family planning unit location which is within MCH OPD centre but most of the time they don't find it easily.

We don't have contraceptives with us in the ward, so they must take it from the family planning center. They have to take everything including guidance from that center so in this way the ward does

not play any important role and we just refer that patient. The poor patient either reaches or wonders here and there and hardly ever reaches. Also, the family planning staff doesn't know how many patients have arrived in the ward although they visit all the time but that is not enough. Here in the ward family planning staff pay visits but suppose if there are four patients, they meet two and unable to reach the other two due to lack of proper policy. For example, there is no policy to stop the patient of abortion to be guided regarding post abortion contraception. We send them to OPD for guidance and obtaining contraceptive services, but they wonder here and there and leave. Secondly, they don't let the patient enter easily as they are asked for the whole history by the guards so to avoid this they leave without any consultation.

4. Conclusions

Post-abortion contraception, key component of post-abortion care (Package) deals with counselling and providing contraception services. The study found numerous barriers at various levels. There were barriers in service delivery due to lack of specialized setting and well trained & dedicated staff, poor counselling skills, staff negative attitude towards abortion patients, lack of coordination between concerned departments and lack of policy regarding post-abortion care. Poor referral system from private to public facilities was also a barrier in use of post-abortion contraception among women's seeking abortion care from private facilities. The study highlighted different social barrier to post-abortion contraception use and compliance. Women's knowledge and awareness related to post-abortion contraception, husband 's decision of contraceptive use, family pressure, religious misconception, accessibility and affordability of contraception were hindrance in post-abortion contraception uptake and compliance.

4.2 Limitation

Firstly, it was a small-scale study of qualitative nature which cannot be generalized to the whole population. Secondly the study attempted to capture the perspectives of health care providers from only one public tertiary care hospital due to time constraint and feasibility issue so the findings cannot be generalized to the private hospital setting. Thirdly, chances of recall bias cannot be ignored as the participant's s were asked to recall their experiences. The study highlighted very sensitive topic around Women's reproductive health which has further unlocked research opportunities in exploring more about women's health priorities.

4.2 Recommendation

- There is an intense need of dealing with post-abortion care as a specialized entity integrated with family planning to prevent unintended pregnancies and reduced long term maternal morbidity and mortality.
- There is an urgent need of devising effective policy and legislation for the regulation of private sector in the provision of post abortion care and coordination between public and private facilities for referral of women for contraception after an abortion.
- To reduce stigmatization pertaining to abortion and its care and to advance the uptake of post abortion care, it is imperative to create health awareness among couples and the community.

References

1. Arambepola, C., Rajapaksa, L.C. and Galwaduge, C., 2014. Usual hospital care versus post-abortion care for women with unsafe abortion: a case control study from Sri Lanka. BMC health services research, 14(1), pp.1-9.

2. Corbett, M.R. and Turner, K.L., 2003. Essential elements of postabortion care: origins, evolution and future directions. *International family planning perspectives*, 29(3), pp.106-111.
3. Curtis, C., Huber, D. and Moss-Knight, T., 2010. Postabortion family planning: addressing the cycle of repeat unintended pregnancy and abortion. *International perspectives on sexual and reproductive health*, 36(1), pp.44-48.
4. Heikinheimo, O., Gissler, M. and Suhonen, S., 2008. Age, parity, history of abortion and contraceptive choices affect the risk of repeat abortion. *Contraception*, 78(2), pp.149-154.
5. National Institute of Population Studies (Pakistan), Macro International. Institute for Resource Development. *Demographic and Health Surveys, 2012. Pakistan Demographic and Health Survey*. National Institute of Population Studies.
6. Paul, M., Gemzell-Danielsson, K., Kiggundu, C., Namugenyi, R. and Klingberg-Allvin, M., 2014. Barriers and facilitators in the provision of post-abortion care at district level in central Uganda—a qualitative study focusing on task sharing between physicians and midwives. *BMC health services research*, 14(1), pp.1-12.
7. Purcell, C., Cameron, S., Lawton, J., Glasier, A. and Harden, J., 2016. Contraceptive care at the time of medical abortion: experiences of women and health professionals in a hospital or community sexual and reproductive health context. *Contraception*, 93(2), pp.170-177.
8. Rahim, N. and Ara, A., 2008. Reasons due to which, women resort to illegally induced abortions. *Journal of Postgraduate Medical Institute*, 22(4).
9. Saleem, S. and Fikree, F.F., 2001. Induced abortions in low socio-economic settlements of Karachi, Pakistan: rates and women's perspectives. *Journal of Pakistan Medical Association*, 51(8), p.275.
10. Sathar Z, Singh S, Rashida G, Shah Z, Niazi R. Induced abortions and unintended pregnancies in Pakistan. *Studies in family planning*. 2014 Dec 1;45(4):471-91.
11. Sathar, Z., Singh, S., Shah, Z.H., Rashida, G., Kamran, I. and Eshai, K., 2013. Post-abortion care in Pakistan: A national study.
12. Shenton, A.K., 2004. Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, 22(2), pp.63-75.
13. Wang, L.F., Puri, M., Rocca, C.H., Blum, M. and Henderson, J.T., 2016. Service provider perspectives on post-abortion contraception in Nepal. *Culture, health & sexuality*, 18(2), pp.221-232.
14. World Health Organization and World Health Organization. *Reproductive Health, 2010. Medical eligibility criteria for contraceptive use*. World Health Organization.
15. World Health Organization, 2003. *The world health report 2003: shaping the future*. World Health Organization.
16. World Health Organization, 2012. *Unsafe abortion incidence and mortality: global and regional levels in 2008 and trends during 1990-2008 (No. WHO/RHR/12.01)*. World Health Organization.