THE 10/90 GAP AND DEFICIENT RESEARCH COORDINATION IN DEVELOPING COUNTRIES: CASE-STUDY OF MONGOLIA AND MOZAMBIQUE

by

Jennifer O'Neill
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Name:	**Jennifer O'Neill**
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Examining Committee:

Chair: **Dr. Tim Beishlag**

Dr. Craig Janes
Senior Supervisor
Professor

Dr. Tim Takaro
Supervisor
Associate Professor

Dr. Stephen Corber
External Examiner
Associate Professor

Date Defended/Approved: November 30, 2007

ABSTRACT

In developing countries, there is a lack of coordination among research groups resulting in insufficient harmonization of research projects. This leads to duplicated and neglected areas of research. This paper will discuss the 10/90 gap and apply it to case studies from Mongolia and Mozambique to illustrate the general public health research situation in developing countries and the effects of inadequate research coordination. The major problem for Mongolia is that there is no efficient network for research coordination. In Mozambique, the major problem is that there is an overall lack of demand for research by policy makers resulting in uncoordinated research without benefits for the population. If research coordination is improved in developing countries, the efficiency and efficacy of research will increase and better policies can be developed. Ultimately, effective strengthening of national health research systems will improve the health of the population.

Keywords: research coordination; Mongolia; Mozambique; developing countries; public health; 10/90 gap

Subject Terms: Public health -- Research -- Developing countries; Developing countries; Public health -- Research -- Developing countries -- Case studies

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INTRODUCTION

Research is recognized as a necessary step for generating knowledge that can be used to drive action (Delisle et al., 2005; Hanney et al., 2003). The evaluation of health research systems is increasing in importance in international institutions such as the World Health Organization (WHO) (Hanney & Gonzalez Block, 2006). The role of health research is to ensure that proposed actions to promote health and break the cycle of ill health and poverty are based on evidence. Health research increases knowledge so it can be applied to improve policy development, health interventions, and health service delivery. These can in turn improve health outcomes in a population (Songane et al., 2005). Acquiring this evidence to support health promoting measures requires research so that these efforts will be most effective and efficient (Delisle et al., 2005). For purposes of this project, health research encompasses projects directed at discovery research, pathogenesis research, epidemiology, clinical research, product development, health services and health systems research, and policy research (Delisle et al., 2005). Research, policy development, training, and advocacy are closely tied and their coordination needs to be supported (Delisle et al., 2005).

A main problem, in general, is that developing countries lack institutions for coordinating research networks and therefore lack collaboration among researchers and research groups (Bolormaa et al., 2004). As a result, there is a

lack of coordination of research projects, which can lead to duplicated and neglected topics, -- i.e, overlaps and gaps in research and knowledge.

Additionally, public health research is under funded, especially in developing countries. It has been reported that only 10% of global health research is directed at the health problems that comprise 90% of the global disease burden (Songane et al., 2005; Delisle, et al., 2005; Bennett, 2005). The global burden of disease is an epidemiological and demographic framework used to estimate health gaps for diseases, injuries, and risk factors. This estimate uses all available mortality and health data and is usually calculated using disability-adjusted life years (DALY) (Lopez et al., 2006). A DALY is a measurement of the gap between healthy years of life lived compared with a standard. DALYs include years of life lost due to premature mortality and years of life lived with a disability or illness (Lopez et al., 2006). As a result of inadequate coordination mechanisms and the lack of successful collaborations for research in developing countries, the 10% of research directed at the world's poorer populations is even less effective than it might otherwise be. Despite high profile donations to health research, there is still a great need for increased funding, human resources, and sharing of information among research groups. It is important for funding increases to be balanced between developed and developing countries (Hanney & Gonzalez Block, 2006). Increased funding in the developed countries will additionally shift the focus from developing countries and will take researchers away from developing countries (Songane et al., 2005). While it is important to attain a high degree of research coordination within a country, it is equally

important to create cohesive global coordination so that findings can be disseminated internationally to ensure that research is not repeated within countries with similar health profiles (Frenk et al., 2005).

In 1990, the Commission on Health Research for Development (COHRED) of the World Health Organization found that global research coordination was lacking and fragmented and recommended that all countries engage in health research, no matter how rich or poor they may be (Neufeld et al., 2001). This report also provided recommendations for research collaboration and partnerships, greater and sustained funding for health research as well as processes for monitoring. Since 1990, there has been some progress and promotion of financial and technical support, however there is still a great amount of work to be completed (Global Forum for Health Research, 2006; Neufeld et al., 2001).

This paper will discuss the 10/90 gap and use examples of case studies of public health research in Mongolia and Mozambique to describe the health research situation in developing countries and the overall effects of inadequate research coordination.

THE 10/90 GAP

Globally, there are large disparities between the diseases affecting the greatest proportion of the population and the diseases that are the focus of the greatest quantity of research (Neufeld & Spiegel, 2005). Research efforts and funds are unevenly distributed in a way that continues to benefit the developed world at the expense of the developing world. While conditions such as acne are researched in developed countries, infectious and parasitic diseases continue to affect the developing world, and few new treatments are available (Bennett, 2005). The global burden of disease has remained largely unchanged over the last 15 years, indicating that the diseases at the top of the list have largely been neglected (Global Forum for Health Research, 2006).

In recent years, there have been attempts to correct this imbalance. The COHRED suggested that developed countries allocate 5% of their health care budgets to research targeting the health problems affecting the developing world (Neufeld & Spiegel, 2005). The COHRED recommended that developing countries allocate 2% of their budget to health research. This decision was based on a study that showed that in 1986 only 5% of the total global budget for health care was spent on the health problems of the developing world. In 1986, the burden of disease in these countries was equal to 93% of the total burden of disease for the world (Neufeld, et al., 2001; De Francisco & Matlin, 2006).

While the Commission's report brought attention to the 10/90 gap, a review of international journals in 2004 showed that the imbalance in health research persists (Songane et al., 2005). Most journals included in the review had an abundance of articles devoted to health issues of high income countries (Songane et al., 2005). In fact, of the five journals reviewed by Songane, Broecke and Modol, health problems affecting developing countries accounted for less than 10% of studies, except in the journal *Health Policy and Planning*, thus indicating that the 10/90 gap in health research is still an issue (Songane et al., 2005). The gap between health status in high income countries and developing countries is actually growing. In 2003, an estimated $126 billion (US) was spent on health research. This is over four times the amount spent in 1986. The rate of increase in research spending is approximately $10 billion (US) per year but accurate figures for health research spending are difficult to obtain from all countries, developed and developing (Global Forum for Health Research, 2006). During this time period, the global burden of disease has also been increasing. The burden caused by noncommunicable diseases has been rising in developing countries resulting in a so-called double burden of disease for these nations (Global Forum for Health Research, 2006).

REVIEW OF LITERATURE

According to the literature reviewed, in resource-limited settings research does not always address an identified need. In countries with limited research abilities, policies and decisions are not based on research. Instead, decisions are influenced by international aid donors or by international practice. In turn, this creates a lack of domestic demand for research, which further reduces the available funding for future research. If policy makers fail to indicate necessary research areas researchers are more inclined to focus on their own interests or abilities (Songane et al., 2005). This creates a cycle that inhibits growth and improvement of the health system. Without the required research, decisions regarding policy are made without supporting evidence. This further reduces the efficiency of ongoing research because the few resources available are spent on issues that are not health priorities of the country and the health of the population does not improve.

Setting health priorities for a country involves understanding the country's burden of disease and its underlying epidemiology, however for countries with poor research capacity, some global priorities have been identified (WHO, 2002). These are described as the Millennium Development Goals (MDG). The MDGs are a commitment of the 189 United Nations member states to address eight goals targeting poverty, ill health, gender inequality, education, water and sanitation. Each goal includes specific targets to be reached by the year 2015

(WHO, 2007). This means that it is not always necessary for a country to conduct its own research into disease burden in the process of setting priorities. Countries with limited research capabilities can apply the global burden of disease and the MDGs to the issues that are relevant within their country. However, it is necessary for the research capacity of a country to improve to a degree that will enable identification, understanding, and the ability to address national health problems (WHO, 2002).

Developing countries cannot simply be the target of a research project. Necessary collaboration includes involvement of a domestic partner for every project (Bennett, 2005). This allows for the host countries' health priorities to be included in research, as well as helping build the local research capacity. The local population will have a much better understanding of the health challenges faced in the region than foreign researchers (WHO, 2002). With proper collaboration, local researchers can identify these areas of importance and receive assistance from the foreign researchers. It is important to include community groups and local populations in research planning so that the true health problems can be addressed and any health programs implemented will succeed with support from the community.

As referred to earlier, an important indicator of the research coordination within a country is the extent to which current health research projects are in line with the MDGs and the described health priorities of the country.

METHODS

I conducted an assessment of health research in Mongolia as part of my required global health practicum. The complete report is included in the Appendix. This project involved an extensive examination of public health research conducted in Mongolia between 2004 and 2007. Original public health and health systems related research studies and abstracts were included (O'Neill & Wagler, 2007). Included studies focused on one or more of seven pre-defined broad public health categories: noncommunicable diseases; communicable diseases; environmental and occupational health; HIV/AIDS, sexually transmitted infections (STIs), and reproductive health; accidents and injuries; food security and nutrition; and health systems (O'Neill & Wagler, 2007). Multiple databases and websites were searched and research organizations were contacted for completed research reports and information regarding current and planned future projects. A list of research organizations was created by the Mongolian Ministry of Health's National Centre for Health Development (NCHD). This list included contact information for many organizations conducting research in Mongolia. These organizations were contacted by email and telephone calls and, when appropriate, hard copies of research reports were obtained directly from the organization.

The data abstracted from the reports included, where possible: title; author(s); date of publication or abstract; researcher affiliation; location; funding

organization; number of pages; journal; URL; purpose; method; target population; sample population; findings; method for identification of the study; details on ethics review; language of publication; keywords; use of findings (implications). Abstracted data were entered into an EndNote Reference Library (O'Neill & Wagler, 2007). This created a searchable public health research database. The reports were analyzed to determine the focus of current research in Mongolia, the target populations of research, and the organizations and research groups conducting research in Mongolia.

The case study of Mozambique was chosen because a similar kind of assessment has been conducted and published (Songane et al., 2005). This example demonstrates a different research problem of a lack of research demand with the same underlying issue of poor research coordination and it illustrates a different set of problems concerning research coordination.

RESULTS

Reviewed case studies involve the health research profiles of Mongolia and Mozambique. These case studies demonstrate the overall lack of research coordination in developing countries and indicate the importance of research for the development of policies, health programs, and interventions. The lack of focus on the health problems affecting these countries is demonstrated by the topics of research conducted. In Mongolia approximately one quarter of the research conducted reflects the priorities as outlined by the Ministry of Health while in Mozambique there is much less coordination. Research reflects the interests of the researchers and the available funding and has no relationship to the health priorities and policy needs.

CASE STUDY - MONGOLIA

The main causes of death in Mongolia are similar to those in developed countries and include cardiovascular diseases, cancer, injury, and poisoning (Bolormaa, et al., 2004). However, Mongolia is an example of a country with a double burden of disease. In the rural areas of the country, infectious diseases are of greatest concern, along with high infant and maternal mortality rates. There is evidence that health inequalities among different groups within the population are growing (Bolormaa, et al., 2004).

In Mongolia, the Ministry of Health (MOH) published a 'Health Sector Strategic Master Plan' in 2005. This report was created based on an analysis of health sector needs and is intended to identify direction and action. Mongolia is a signatory country to the Millennium Development Goals (MDGs) and therefore is committed to achieving these goals by 2015 (O'Neill & Wagler, 2007). Accordingly, the main health priorities as outlined by the Mongolian MOH's Health Sector Strategic Master Plan and the MDGs for Mongolia were child and infant mortality and maternal health. (Ministry of Health Mongolia, 2005; World Bank, 2000), though these priorities are not necessarily commensurate with the aforementioned epidemiologic profile of the country. Between 2004 and 2007, 24% of public health research projects targeted Mongolian children under the age of 16, and 9% of studies focused on women of reproductive age. Communicable diseases were the focus of 40% of research studies; with studies

of HIV/AIDS, STIs, and related reproductive health problems accounting for 25% (O'Neill & Wagler, 2007). These data suggest that there is a reasonably good match between identified health priorities, the MDGs, and public health research in Mongolia. Given this profile, a more important question is whether the efforts directed at identified priorities are being coordinated among research groups to maximize available resources and policy effects. While the findings suggest that the priorities are being researched, the numbers do not give an indication of the degree to which efforts are coordinated and communicated in efforts to reduce research overlap and address gaps.

Another difficulty is that Mongolia's Strategic Plan is based on research conducted preceding the report, not on the overall burden of disease (Ministry of Health Mongolia, 2005). The report was published in 2005, but it is fair to conclude that the scope of research has remained largely unchanged in the two years since its publication. This may limit the finding that research in Mongolia addresses the MOH's health priorities since the needs of the country were not determined by external sources or an evaluation. Instead, they may be a reflection of researcher or donor interests. External evaluations are less subjective because they are more likely to consider additional stakeholder interests, not one in particular, and they are more likely to employ a methods-driven approach (Christie, 2003).

The majority of public health research in Mongolia is conducted by government institutions, such as the Ministry of Health and the World Health Organization (WHO). These two groups account for approximately 50% of all

research conducted from 2004 to 2007 (O'Neill & Wagler, 2007). This may aid coordination since the government institutions work closely with the WHO. In addition, these groups have developed some research coordination mechanisms including development of an accessible repository of published documents containing research abstracts available in both hard and electronic copies. Other mechanisms include the Ministry of Health's website, which contains a list of most MOH and WHO supported research projects and their abstracts. However, the website is in Mongolian and the searchable database is in English. Some project titles are listed in Mongolian and some in English but the abstracts are not shown in both languages (O'Neill & Wagler, 2007). While this does not affect in-country research, it might impede foreign researchers in their attempts to get background knowledge on a potential research topic, or to develop a research partnership around a specific topic, resulting in the duplication of a current or previous study.

Although two organizations account for sponsoring 50% of the research, the other 50% is conducted by independent research groups without standardized coordination mechanisms. One attempt at coordination among these groups is the Health-Related Organizations' meetings held monthly and intended to bring together representatives from local NGOs. It is intended to provide a venue for project proposal presentations and dissemination of findings, however attendance is voluntary (O'Neill & Wagler, 2007).

In general, despite coordination efforts, researchers in Mongolia indicate that there is an overall lack of coordination. The MOH website is not well known,

even among other public health research organizations within the government. Researchers and government employees indicated that they do not know how to locate research reports. Researchers indicate that there is no useful mechanism for research coordination in Mongolia (O'Neill & Wagler, 2007).

Between 2004 and 2007, only 26% of researchers working in Mongolia published their reports in academic peer-reviewed journals (O'Neill & Wagler, 2007). This additionally limits the ability of independent researchers to gain an understanding of previous and ongoing research projects and inhibits collaboration among research groups. The lack of publication indicates that the vast majority of research in Mongolia is not well disseminated and must be obtained directly from the research organization, presuming the research is even identified.

The number of reports we located is likely not an accurate reflection of the amount of research conducted in Mongolia during these three years. This is due to the difficult identification of active researchers within Mongolia and the inaccessibility of reports that were not published in international journals. There may thus be a number of research organizations and research projects unaccounted for in this review. Subsequently the counts used to determine the focus of research and the target populations are missing these studies.

While 90% of research projects conducted by foreigners in Mongolia between 2004 and 2007 identified a domestic partner, there is no indication of the nature of the partnership (O'Neill & Wagler, 2007). Furthermore, those reports and abstracts indicating affiliation with a Mongolian group or organization

did not indicate whether the domestic partner was involved in research design activities or was instead a more passive scientific partner.

Overall, Mongolia has a serious problem with research sharing and therefore knowledge sharing. A research assistant from the NCHD assisted us with contacting research organizations. Multiple emails were sent to research organizations within Mongolia, in both Mongolian and English languages. These elicited few responses. Follow up requests for research reports included telephone calls from the NCHD representative, but these generated few responses. Thus, while the government attempts to foster research coordination these efforts are insufficient.

Another example of the reluctance of some researchers within Mongolia to share their important findings is demonstrated by a report from a Mongolian Public Health Graduate student. In his study he discovered that blood lead levels in Mongolian children were between 16 and 32 µg/dL (Baigali, 2007). The action level defined by the Centers for Disease Control and Prevention is 10 µg/dL but levels as low as 5 µg/dL have been associated with behavioural effects and decreased intelligence (Galvez, Forman & Landrigan, 2005; Lanphear, 2005). The Mongolian levels are clearly higher and Baigali's study identified neurological effects such as memory loss, irritability, and short attention span among children (Baigali, 2007). This important information has not been published even though it could be used to change policies related to the use of leaded gasoline within the country. In other developing countries, blood lead levels have been reduced by up to 90% following the ban of leaded gasoline (Landrigan, 2002).

While there is some focus on the health priorities of Mongolia it is unclear whether the research included in this review has had any effect on policy and program development. This report is intended to be a foundational step towards creating a research coordination mechanism within Mongolia. The research inventory can be used to determine the role of research in health policy development.

Based in part on this report, in October of 2007 the Canadian Coalition for Global Health Research (CCGHR) began a project to strengthen the Mongolian national health research system. This is included as part of the CCGHR's Country Focus Strategy (CFS) (Davison, 2007). The CFS approach is to support the efforts of local Mongolian researchers in coordinating health research efforts, particularly through assistance in funding and organizational activities. The initial partnership will include a representative of the NCHD and Simon Fraser University (SFU) professor Craig Janes as the CCGHR team leader. This strategy aims to include health research system strengthening in efforts to support the overall improvement of the country's health system and ensure the effective collaboration of Canadians in these activities (Davison, 2007).

CASE STUDY - MOZAMBIQUE

Similar to most developing countries, resources for health research in Mozambique are limited (Songane et al., 2005). Research in Mozambique is mainly biomedical and does not focus on public health, health policy, or health systems issues (Songane et al., 2005). Health research is only conducted by a few institutions. Donor agencies and NGOs conduct a small portion of the country's basic health research and their role is largely consultancy based or focused on monitoring and evaluation activities. Their studies provide the small amount of policy and health systems research conducted in Mozambique (Songane et al., 2005).

Health research expenditure in this country does not meet the 2% suggested spending as outlined by the WHO's COHRED (Songane et al., 2005). Mozambique is a country with limited research capacity and little demand for research by policy and decision makers. Research allows policies to be based on legitimate facts and can mean the difference between successful and unsuccessful policies and programs (Hanney et al., 2003). It allows for policy makers to see both arguments and possible outcomes to aid in the decision making process. Because research is required for developing evidence, and evidence is a contributing factor to good policy development, creating good policies is extremely difficult in Mozambique. Asking for specific research is viewed as a waste of resources because available funding is scarce. In addition,

Mozambique, like Mongolia, has weak national research coordination mechanisms. There is limited ability in Mozambique to disseminate research results but also to identify research needs (Songane et al., 2005). Research is not conducted on the basis of the main needs of the country, but instead on the skill level or interests of the individual researcher or research groups, donor agendas, or based on the type of funding available. As in other resource-limited countries, policy decisions are not based on evidence, but on what is most likely to keep the current system operating and balanced (Songane et al., 2005).

While the situation regarding research in Mozambique is far from ideal, research has been used in a selected number of cases to influence policy development. For example, with regards to malaria treatment, policy makers sought advice of researchers and asked specific malaria treatment related questions resulting in changes to malaria treatment policies (Songane et al., 2005). Unfortunately, this is not the most common procedure.

Mozambique's situation requires improving the relationship between researchers and policy makers. Songane, Boecke and Modol suggest increasing the role of the Ministry of Health (MOH) in setting research and policy agendas. The MOH needs to decide on priority research as well as ensuring the research institution best suited to handle the task is involved in the research (Songane et al., 2005). These authors also suggest that research funding should be based on a system of contracts to limit the research conducted solely to match the interests of the researchers.

Mozambique needs to set a research agenda and use this to aid policy development and implementation. Included within this is the importance for Mozambique to determine national health priorities and use these and the MDGs to guide research. Similar to Mongolia, once more research is conducted in Mozambique the methods to disseminate research findings will need to be strengthened. The advantage here is that while research capacity and demand are increasing, there is an opportunity for the coordination mechanisms to be developed simultaneously.

CONCLUSION

Despite some improvements in efforts to address the disparities between the greatest health problems facing the world and the health problems receiving the most attention, there is still a need for greater emphasis on resource allocation and a more focused public health research agenda (Neufeld & Spiegel, 2005).

The global research capacity needs to be increased so that research agendas may be set, priorities outlined, and research coordination mechanisms implemented. Research capacity among researchers of developing countries needs to be strengthened so that the quality of research conducted by researchers in these countries will improve (Global Forum for Health Research, 2002). This may assist in increasing the quantity of research so that these countries can take control of the majority of research conducted within their borders. Without research capacity in developing countries equal to that of developed countries, the greatest health issues in developing countries will continue to be ignored (Global Forum for Health Research, 2002). Research findings and recommendations must be available and adjusted so that they are clear to policy and decision makers (WHO, 2002). Research conducted without adequate sharing of findings and recommendations will not have a role in influencing decisions within the country.

When findings are not shared, certain questions arise. What is done with the research conducted? Are research findings used in policy or program development? It is well known that policies resulting from research-based evidence are better than those that are not (Hanney et al., 2003). Without adequate networks or mechanisms to share research findings and recommendations, it is difficult to determine how the data from completed research are used. In the case of Mongolia only one quarter of research project reports were published in academic journals between 2004 and 2007. The ways in which other research findings are used is unclear. Some reports are compiled in government documents, while others are available only through the research organization and others are completely unaccounted for. Mongolian university students as well as various international university-based researchers conduct research in Mongolia. Their research reports may be published in academic journals or may be published in the university's library. Abstracts can usually be obtained from the university's library however, the full report is not always freely available. Research conducted by university-based researchers is generally difficult to identify unless the report is published. There is currently no mechanism for coordination among these groups.

Additionally, there is no evidence to suggest that findings from studies by international groups are shared with the local population of Mongolia. It is unclear if these results have any influence on policy or program development. For international researchers, it is far from responsible practice to conduct research in developing world settings and not share the findings or recommendations with

the population involved. At the very least these should be available in an open publication. Research conducted but not shared has no impact on the population. The local population will receive no benefits from any knowledge gained.

Overall, the research conducted in developing countries may not be providing any benefits to the local population. With research coordination mechanisms the efficiency of research can increase resulting in improvements in policy. This could lead to an overall increase in the health status of the population.

RECOMMENDATIONS

It is now apparent that countries need to develop research agendas to address their national health priorities and the MDGs. Researchers need to adhere to this research agenda and disseminate their findings through publications or mechanisms that allow other researchers to view research findings as well as ongoing research projects. Coordination of research is necessary to ensure the limited funds available to health research in developing countries are used effectively. It rarely makes sense for multiple research projects to be conducted on the same topic and population within a country or within countries with similar health problems and priorities. Duplicate studies are a waste of resources and time. An effective coordination and networking mechanism will prevent this occurrence, thereby allowing for increased availability of researchers and resources for further research projects. A country's health priorities will be more effectively addressed with adequate coordination and dissemination of findings.

Songane, Broecke and Modol (2005) suggest rearranging research groups in developing countries as a way to increase research efficiency. If coordination is increased between the country's main research institutions as well as consultants and aid agencies, the effectiveness of limited resources could be improved (Songane et al, 2005). Coordination will only improve when all groups involved in research including the Ministry of Health decide on a research

priority list that addresses the national health priorities as well as the MDGs (Songane et al, 2005).

Organizations involved in the coordination of public health research include the Child and Adolescent Health Development division of the WHO. This division of the WHO has outlined optimal strategies for research in the area of child health (WHO, 2002). These strategies are applicable to all public health research and include setting priorities, encouraging national ownership, improving the relationship between research and implementation, disseminating research findings, and encouraging a multi-sectoral approach (WHO, 2002).

Domestically, the Global Health Research Initiative of Canada (GHRI) ensures that research involves collaboration between both Canadian researchers as well as partners in the targeted developing country. The GHRI is also interested in ensuring that research adheres to ethical standards and fosters capacity building and sustainability within the developing country (Bennett, 2005). Additionally, the Canadian Coalition for Global Health Research (CCGHR) is an organization focused on research to improve health in low-to-middle income countries. The CCGHR strives to link research to practical applications and to strengthen the national health research systems in developing countries (CCGHR, 2005).

While it is important for each research organization to be rewarded for their efforts, for example with increased or continued funding, this can be a barrier to information sharing. This requires efforts to reinforce, yet again, the

benefits of sharing results with all researchers within developing and developed countries.

The Mongolian case study demonstrated that a large portion of international researchers, 90% in this example, identify a domestic partner in their research reports or abstracts. This is a potential target for research coordination efforts. Increasing domestic researchers' awareness of research projects within their country can assist foreign researchers in gaining knowledge about other ongoing and completed research. This requires that the domestic partner has an active role in the research partnership which will rely on efforts to strengthen domestic-foreign research partnerships.

It is not enough for coordination mechanisms and research agendas to simply exist. The information has to be publicly accessible and its existence needs to be well-known to allow prospective and current researchers to be aware of what evidence already exists, what research has been done, and what is still required. It would be beneficial for research networks to be wide enough to include policy makers to create the possibility for partnerships between those involved in research, and those involved in policy development.

CRITICAL REFLECTION

My practicum work consisted of a project requested by the Mongolian Ministry of Health's National Centre for Health Development. Along with another SFU graduate student, I was involved in systematically reviewing all public health research reports and abstracts from 2004 to 2007. We created a searchable database using information from these reports and abstracts and created a public health research inventory. We analyzed the data to determine the main focus of research projects in Mongolia, the target populations, and the organizations conducting research. We determined that about a quarter of research in Mongolia is addressing the country's stated health priorities and addressing the priority populations outlined in the Strategic Master Plan. We discovered that about half of the research is conducted by international organizations who, over the three years that we included in our search, were involved in only one to two projects. This means that there is no strong connection between the researchers and the host country and that, for the most part, the research focus is more related to the interests of the research group and not to the overall improvement of Mongolia's health status.

This research is intended to be used by the NCHD to secure funding by the CCGHR. This funding will be used to create coordination mechanisms within the country. In addition, our research is a foundational step towards determining the extent to which health research in Mongolia is used in policy development. I

hope that this next step is undertaken by the NCHD and that our report and searchable database are used not only by employees and research groups at the MOH but also by other research organizations and international research groups. For this to be possible, it is necessary that the existence of our report is known to other research groups and these groups are able to access and use the database. In October of 2007 this report was used by the CCGHR in the development of a project to strengthen the Mongolian national health research system by supporting coordination efforts through assistance in funding and organizational activities.

In addition to my work with the NCHD, I worked with a non-governmental organization (NGO) during my summer in Mongolia. As I reviewed articles for the MOH for my research, I discovered a large report by UNICEF on a health knowledge and attitudes survey. One of the projects I assisted with while working at the NGO was the creation of a baseline survey report that included analyzing survey data. Most of the questions and responses were similar to those in the UNICEF project. Unfortunately, the NGO must conduct a baseline survey to receive the required funding or receive continued funding for their health projects. This is a waste of resources. UNICEF likely conducted a larger, more expensive, and more carefully developed and implemented survey compared to the one conducted by this NGO, however the NGO has to recreate the same survey. This is another example of poor research coordination in developing countries as the resources and time spent on the NGOs baseline survey would have been better spent on the program itself and the baseline data could have been found in the

report by UNICEF. However, this would have affected the evaluation of the program and may have impeded the program's subsequent funding. Perhaps a more productive solution would be to reevaluate the requirements for funding and allow NGOs to build and develop their programs using research that has already been conducted when the results will be very similar.

I have learned that the seemingly simple baseline survey becomes much more complicated in a developing country where the donors are external and have their own agendas. In this example in Mongolia, the project is a health education program for schoolchildren. Instead of a baseline survey revealing information already identified by the UNICEF study, the resources and time would have been better spent working to expand the health education program to additional schools. The employees at this NGO admitted that they are not very familiar with creating surveys and therefore the effectiveness and accuracy of their survey and data is unclear. The NGO did not have as much work for me as I had expected. In the future, I would have ensured that there would be a specific project for me to work on, or I would have been prepared to create my own project. I had a great experience at the NGO as it gave me a chance to use a variety of skills, but I would have preferred to have joined the MOH project earlier. The experience would have been more rewarding if I could have been a part of the planning process.

Overall, both of these work experiences were very valuable and I was able to apply many of the skills that I have developed in the preceding semesters. I

was able to enhance my writing and editing skills and had the opportunity to work with researchers in public health.

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APPENDIX

An Assessment of Public Health Research in Mongolia, 2004-2007: A systematic review and research map

Jennifer O'Neill & Meghan Wagler, 2007

Introduction and Background

Developing countries, in general, have a lack of networks among researchers, which results in lack of coordination among research projects (Bolormaa, Bujin & Mashbadrakh, 2004). Mongolia has been facing the same challenges in public health development. A major issue for public health in Mongolia, besides the poor collaboration and lack of information sharing between various research organizations, is related to the fact that there is not a clear and systematic research plan. Other issues are that research capacity in the country is weak in comparison to other countries and research findings are rarely used. (Bolormaa, Bujin & Mashbadrakh, 2004).

The goal of this project is to develop a map of public health research in Mongolia to be used as a foundational step towards creating a coordination mechanism for public health research in Mongolia. This project will focus on determining who is conducting public health research in Mongolia; the focus of research; what the results are; what the results are used for and what has been published and where. This project will hopefully serve as a first step in facilitating collaboration among researchers and assist with the translation of knowledge into policy and practice.

In recent years, the government in Mongolia has taken initiatives to strengthen the country's public health system. The National Public Health Council was established in 2002 in an attempt to coordinate activities that can promote and sustain health (Bolormaa, Bujin & Mashbadrakh, 2004). The Public Health Professionals Council and the Local Public Health Councils were created to coordinate national public health programs. However, none of these groups are responsible for coordinating the various researchers and research projects within the country (Bolormaa, Bujin & Mashbadrakh, 2004). There is currently no coordination of public health research in Mongolia and no mechanism to coordinate it. There is a lack of knowledge within the country about current research projects and groups conducting research on public health topics.

This report was requested by the Mongolian National Center for Health Development and conducted by Simon Fraser University Graduate students Meghan Wagler and Jennifer O'Neill under the supervision of Oyun Lkhagvasuren. The immediate result of this project will be a map of public health research in Mongolia to be used by the National Center for Health Development. This will include a searchable

database of public health research documents. The ultimate goal of the project is to create a coordination mechanism for public health research in Mongolia.

Methods

Inclusion/Exclusion Criteria

We included original public health and health systems-related research studies and abstracts which targeted the Mongolian population and/or any of Mongolia's sub-populations which were carried out and/or published between January 1, 2004 and June 12, 2007. According to the objective of creating a map of public health research in Mongolia as outlined in the previous section, eligible studies focused on some aspect of the broad field of population and public health and health systems. In general, we included studies which fit into one or more of 7 broad categories:

- noncommunicable diseases;
- communicable diseases;
- environmental and occupational health;
- HIV/AIDS, STIs and reproductive health;
- accidents and injuries;
- food security and nutrition; and
- health systems.

We excluded studies related to drug-trials, experimental studies involving other clinical interventions, and genetics studies. We also excluded review articles and opinion pieces.

Search Strategy

Database and website search

We searched the following eight databases for relevant studies published between 2004 and June 12, 2007: PubMed; AIDSearch; CINAHL; Global Health; Health Source; POPLine; and Web of Science. We obtained the Pubmed search results for a search conducted in November 2006. The search criteria used for this search were: "Health Services"[MeSH] OR "Health Status"[MeSH] OR "Delivery of Health Care"[MeSH] OR "Health Care Economics and Organizations"[MeSH] OR "Health Policy"[MeSH] OR "Health Planning"[MeSH] AND "Mongolia"[MeSH] Limits: English, Publication Date from 2000 to 2006, Humans. We also performed an updated search for more recently published studies and studies of all languages. For all databases but one, we searched using the term "Mongolia". We searched "Mongolia AND health" on Web of Science. We did not use any limitations besides year of publication. In addition to the database search, we searched a number of organizational websites for study reports including: the World Bank; the Asian Development Bank; World Vision; UNICEF; UNFPA; and the Soros Foundation.

Contact with key informants

We contacted a number of potential research organizations with offices located in Ulaanbaatar city in order to obtain relevant study reports and/or information about their public health research activities. Two key informants were consulted in order to come up with a list of local organizations that may be carrying out public health research. When possible, a representative from each of these organizations was contacted by Email and/or telephone and/or in person.

Definitions

Mongolia is defined as the politically defined nation-state of Mongolia, also known as Outer Mongolia. Inner Mongolia which is a region in Northern China is not included in this definition.

Data Abstraction

Upon review of eligible studies we abstracted the following information when available: title; author(s); date of publication or abstract; researcher affiliation; location; funding organization; number of pages; journal; URL; purpose; method; target population; sample population; findings; identification of study (source); details on ethics review; language of publication; keywords; use of findings (implications).

Data Analysis

We entered all extracted information into an EndNote Reference Library in order to create a searchable database, a complete reference list and an annotated bibliography of all eligible studies. Using EndNote, we performed frequency counts in order to describe important characteristics of the group of identified studies. These characteristics include research themes, target populations, research organizations, and publications in peer-reviewed journals.

Results

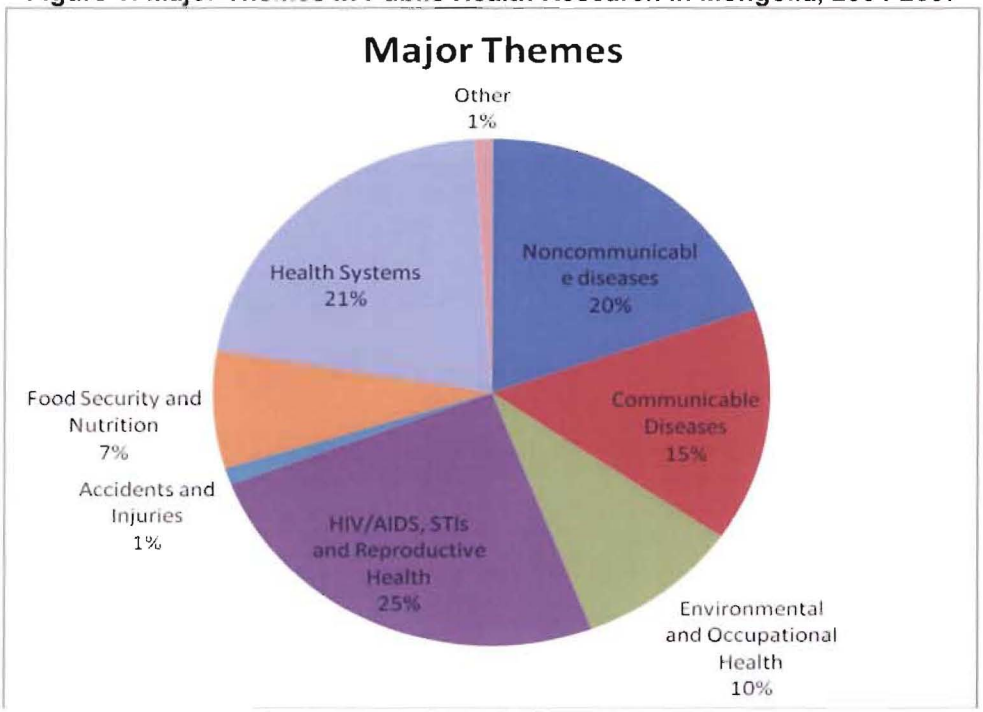
We identified and reviewed 137 studies which matched our inclusion criteria. The complete list of studies is presented in appendix A. The list of studies is also presented in the form of an annotated bibliography (appendix B) which includes a brief abstract for each study when available.

In the next section, we present our research 'map' - our key findings on some of the characteristics of public health research in Mongolia since 2004 including major research themes, main target populations under study, predominant research organizations and number of publications in international peer-reviewed journals.

Findings

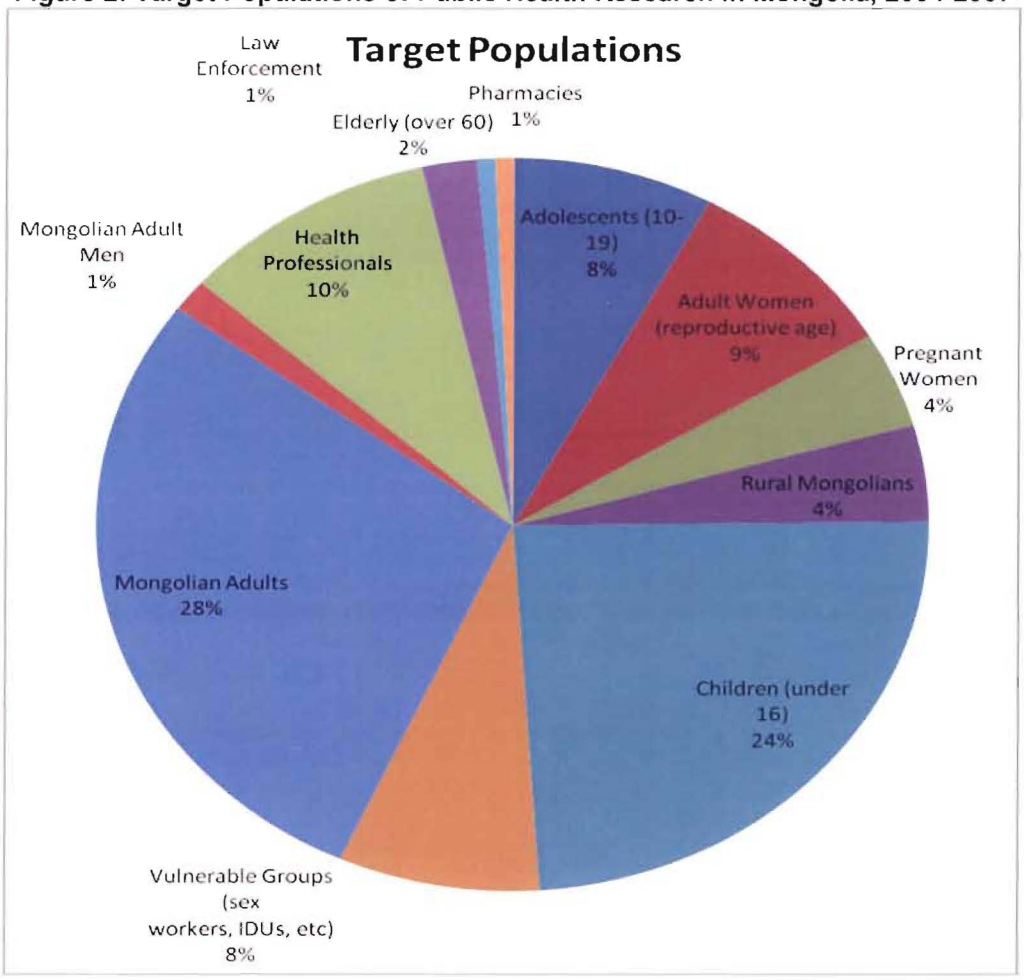
The main themes in public health research conducted in Mongolia in the last three years are displayed in Figure 1. It should be noted that each study was categorized as fitting under at least 1 of the 7 denoted themes and many studies fit into 2 or more themes. This explains why the total theme count does not add up to the total number of reviewed studies. The most common theme was HIV/AIDS, sexually transmitted infections (STIs) and reproductive health. These topics were investigated in 47 research reports. Health systems (including health services, human health resources, health legislation, health sector reform, etc.) were the focus of 40 studies. Communicable (other than HIV/AIDS and STIs) and Noncommunicable (including mental health) diseases were studied in 28 and 37 reports respectively.

Figure 1: Major Themes in Public Health Research in Mongolia, 2004-2007



The population most commonly targeted in public health research in Mongolia for the last three years was adults. The target population of Mongolian adults does not include studies which targeted a specific subgroup of this population such as adult men or adult women. This general group of Mongolian adults was the target population for 40 of the studies. Children under the age of 16 were the target population of 34 studies. Health professionals were the target population in 14 studies. Adult women of reproductive age were the specific target population of 12 studies and adolescents and vulnerable groups (including injection drug users, sex workers, etc.) were the target population for 11 studies each. The distribution of target populations is shown in figure 2.

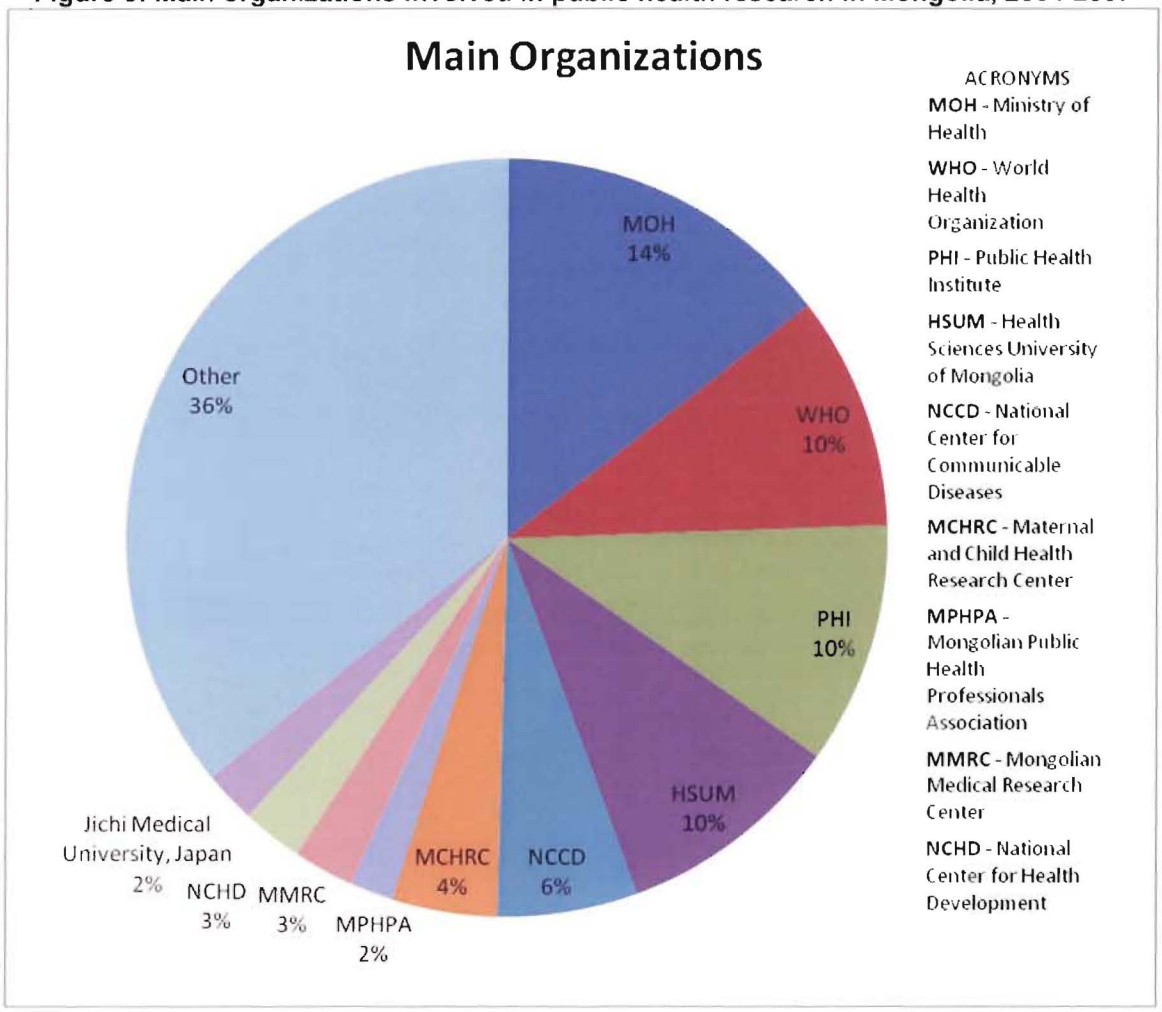
Figure 2: Target Populations of Public Health Research in Mongolia, 2004-2007



There are many organizations that conduct public health research in Mongolia. Various universities and international groups have conducted research in Mongolia during the last three years. However, most of these groups have undertaken only one study focusing on the population of Mongolia. Research groups with one to two reports or abstracts from studies in Mongolia for the last three years make up 97 of the 137 reports collected.

Of groups that have conducted multiple studies in Mongolia, the Mongolian Ministry of Health has been involved in the most research activities in the field of public health. The Ministry of Health has conducted 38 studies since 2004. The Public Health Institute has been involved in 28 studies. The World Health Organization is also actively involved in research and has been involved in 27 studies. The Health Sciences University of Mongolia has conducted 26 studies for which reports or abstracts could be located. The Jichi Medical University of Japan has conducted six studies in Mongolia in the last three years. The distribution of organizations involved in public health research in Mongolia is displayed in figure 3. Research organizations which have conducted less than six studies in Mongolia in the last three years are included in the 'other' category.

Figure 3: Main organizations involved in public health research in Mongolia, 2004-2007



Of the studies for which reports or abstracts could be located, 36 have been published in academic journals.

Twenty-one (21) reports mentioned that ethical clearance had been obtained for the studies.

Discussion

Focus and target populations of public health research versus priority health issues

One objective of this study is to investigate to what extent the recent foci of public health research in Mongolia actually reflect the health priorities of the population. This knowledge is useful in that it is an indicator of level of research coordination - too much (overlap) or too little (gaps) focus on certain health issues may indicate a lack of coordination between research groups and therefore an inefficient and ineffective use of

resources. For our purposes, Mongolia's health priorities were derived from the Ministry of Health's 'Health Sector Strategic Master Plan' as well as the Millennium Development Goals (MDGs) for Mongolia (World Bank, 2000). The main health priorities are summarized by source in Table 1.

Table 1: Mongolia's population health priorities

Health Sector Strategic Master Plan: 2006-2015, Volume I (Mongolian Ministry of Health, 2005)
High child/infant mortality – malnutrition, especially vitamin D, iron, iodine in children under-5
High maternal mortality
High rates of communicable diseases, especially STIs, tuberculosis, hepatitis
Gastrointestinal and respiratory communicable diseases in rural areas
Non communicable diseases especially CVDs, cancer, injuries especially in children
Health changes related to the change from an active to a sedentary lifestyle, change in diet due to availability of poor quality imported food, increased alcohol and tobacco consumption and increased domestic violence due to unemployment
Shortage of food and blocked access to health care during natural disasters (dzud)
Millennium Development Goals for Mongolia (The World Bank, 2000)
Reduce by two-thirds, between 1990 and 2015, the under-five mortality rate
Access for all individuals of appropriate age to required reproductive health services and reduce by three-quarters, between 1990 and 2015, the maternal mortality ratio
Have halted by 2015, and begun to reverse, the spread of HIV/AIDS
Reverse the spread of tuberculosis by 2015
Implement a separate program to control dental diseases among population

Mongolia's public health priorities according to the Master Plan and the MDGs

In 2005, the Mongolian Ministry of Health published the 'Health Sector Strategic Master Plan'. This reference document was developed based on a situation analysis of the health sector and is meant to identify direction and actions for the development of Mongolia's health sector over the next 10 years. As such, this report provides an outline of Mongolia's current population health profile and health priorities. The overall goal of Mongolia's Health Sector Strategic Master Plan is "to improve the health status of all the people of Mongolia, especially mothers and children, through implementing a sector wide approach and providing responsive and equitable, pro-poor, client-centered and quality services."

The Millennium Development Goals (MDGs) represent a commitment of the 189 United Nations' member countries to address global poverty, hunger, education, gender, equality, the environment and health. The MDGs are to be achieved by 2015. Three of these goals are explicitly related to health. These are the reduction of under-5 mortality (U5M) by two-thirds, the reduction of maternal mortality by three-quarters and the reversal of the spread of HIV/AIDS, malaria, TB and other major diseases (World Bank,

2000). Mongolia is a signatory country to the Millennium Declaration and has thereby resolved to strive towards the timely achievement of these goals.

How well does the focus of current research (2004-2007) reflect the health priorities outlined in the Master Plan and the MDGs?

According to the Master Plan and the MDGs, the main health priorities in Mongolia are child/infant mortality and maternal mortality. Since children under the age of 16 and adult women of reproductive age were the target populations for 24% and 9% of studies respectively and STIs, HIV/AIDS and reproductive health and communicable diseases account for 25% and 15% of themes respectively these two health priorities are reflected in current public health research in Mongolia.

Organizations involved in public health research in Mongolia

The majority of research in Mongolia is conducted by the World Health Organization and governmental institutions. Some of these include the Ministry of Health, the National Center for Health Development, the Public Health Institute, and the National Center for Communicable Diseases. Research is also conducted by the Mongolian Public Health Professionals Association, the Mongolian Medical Research Center, the Maternal and Child Health Research Center and the Health Sciences University of Mongolia.

Research is also conducted by international groups predominantly from academic institutions. Examples of these include the Jichi Medical University of Japan, which is involved in the greatest number of studies by an international group, as well as other universities such as the University of Colorado at Denver, the University of Michigan, the University of Southampton, McGill University, the University of Alberta and the University of Helsinki. International research organizations are also involved in research in Mongolia. Examples of these include the German Research Association, the International Development Research Centre (Canada) and the Swiss International Development Agency.

Only 14 of 137 studies (10%) included in this report did not indicate a domestic partner in their report or abstract. This indicates that domestic institutions likely have a major role in setting the public health research agenda in Mongolia at least to some extent. As such, domestic institutions should be a key target in any subsequent efforts to increase research coordination in Mongolia.

Coordination of public health research activities in Mongolia

Current coordination and knowledge sharing mechanisms

As stated in the first section of this report, the findings of this study are meant to serve as a foundation and first step in the creation of a more formal and effective coordination mechanism for public health research in Mongolia. It is thus important to identify the coordination and knowledge sharing mechanisms that already exist. Table 2 displays a list with brief descriptions of some of the main coordination/knowledge sharing

mechanisms we were able to identify while carrying out this study. This list is based on information obtained from key informants as well as through our own search efforts (i.e. how we were able to identify and locate research studies).

Table 2: Some current public health research coordination mechanisms in Mongolia

Publications	
Mongolia Medical Sciences in 2004, 2005 & Heritage and Innovation of Medical Sciences in Mongolia 2006	This annually published document contains study abstracts in both Mongolian and English for health-related research carried out in Mongolia. This publication is printed and distributed with the financial support of the WHO Mongolia Office. It is available in both hard copy and electronic versions (Burmaa, 2005 & Burmaa et al. 2005, 2006).
International peer-reviewed academic journals	Thirty-six public health research studies conducted in Mongolia were published in international peer-reviewed academic journals between 2004 and mid-2007. This number is low and makes up only 26% of all identified studies.
Health Sciences Academic Journal (Ulaanbaatar, Mongolia)	The Health Sciences University of Mongolia (HSUM) publishes an academic health and medical journal in Mongolian with English abstracts. Publication commenced in 2006 and the journal is currently available in hard copy only. It is available by subscription and at the HSUM and PHI libraries.
Websites	
Mongolian Ministry of Health – www.moh.mn	Most study reports of research supported by the Mongolian MOH and the WHO can be viewed and downloaded from the MOH website. The website is written in Mongolian however the searchable reports database is in English. The actual report documents are in either English or Mongolian or are available in both languages. The studies which are not available in English do not have their titles listed in English and vice versa.
Meetings and Conferences	
Health-related Organizations' (HRO) Meetings	Representatives from local NGOs organize and run a health-related organizations' meeting each month for all health-related organization members who wish to take part. This includes both domestic and international organizations as well as both governmental organizations/institutions and NGOs. This two-hour monthly meeting involves presentations on project proposals, study findings, and reports on ongoing projects. It provides a venue for networking and coordination between organizations devoted improving the health of Mongolia's populations. Attendance is voluntary.
Scientific Conference: Heritage and Innovation of Medical Sciences in Mongolia – November 24, 2006 (Ulaanbaatar, Mongolia)	This conference was organized by the Mongolian Academy of Medical Sciences and the Ministry of Health. Domestic and international researchers and scientist were invited to submit abstracts related to public health, clinical medicine, biomedical sciences, traditional medicine, and pharmacy. Conference plenary sessions were translated in Mongolian and English. A book of conference abstracts was published in Mongolian and English (Burmaa et al. 2006).

Discussions with key informants were helpful in our preliminary investigation into the extent of coordination in public health research in Mongolia. The list presented in Table 2 indicates that there are some useful coordination mechanisms in place. Despite these, there seems to be a general feeling among some researchers in the field that coordination remains a problem. The MOH online database does not seem to be well-known even among many key public health researchers in other related government institutions. Multiple informants stated that as far as they know there is no database containing health research reports, no useful mechanism in place for research collaboration and no real public health research network. The fact that these statements

were made indicates that there is at minimum a lack of awareness of coordination mechanisms among active researchers.

We had many problems as researchers ourselves obtaining information about the research activities of others in the field. One reason for this was that our conventional forms of communication were not very effective. Most importantly, communication via Email often did not prove to be useful. We sent out a number of Email meeting and information requests and had a generally low response rate. We attempted to improve our response rate by sending reminder Emails and by calling the Email recipients on the phone to notify them of our Email requests. Opinions of our Mongolian counterparts and other informants seem to confirm the fact that Email is not a very commonly used and thus effective form of communication in Mongolia. This may help to explain why research coordination, and information and knowledge sharing has been difficult in Mongolia. Another possible reason for this, as suggested by at least one informant, is that organizations often avoid sharing their findings with others in the field out of fear that others will steal their work. It should be noted that this is not thought to be an issue unique to Mongolia but rather a problem that pervades many institutions and countries. This is a hindrance to coordination and greatly limits the usefulness of research findings.

Limitations

Limitations with this project include the difficulty faced getting responses from the various research organizations. We sent several Emails in English and Mongolian but did not receive many responses. This limits our work as we were unable to include the research of these organizations in our research map and database although it is likely that these groups have conducted research in the field of public health. In addition, the low response rate to Email information requests in conjunction with time constraints prevented us from collecting useful information on current and ongoing public health research initiatives in Mongolia. In addition, as the two main researchers involved in data collection do not speak or read Mongolian there may be some Mongolian-only study reports which were not identified.

Conclusion

To our understanding, we have created the first all-inclusive inventory of public health research in Mongolia. Using this inventory, we have made a searchable study database as well as an annotated bibliography of all recent (past three years) public health research that was carried out targeting the Mongolian population. It is our hope that this database and bibliography will serve as useful knowledge sharing tools for researchers as well as a starting point for NCHD efforts to improve research coordination.

Through this exercise, we have also gained some insight into the issues surrounding health research coordination in the country. This was only a preliminary investigation into coordination issues and as such we are unable to make any real

conclusions. We have, however, come up with some potentially useful topics for further investigation into the issue of research coordination and collaboration in Mongolia. Possible areas for future research include, but are not limited to: a study of the current modes of communication between people and institutions in Mongolia; a study on the beliefs and attitudes about knowledge sharing within Mongolia's health research community; a study on the current methods of research dissemination.

As an extensive systematic review, our work also serves as the necessary first step for a study of the impact of recent research findings on public health policy in Mongolia. In fact, one of the original goals of this study was to find out how study results are used, for example in policy development. Due to time constraints we have determined that we would be unable to accurately make this assessment and have been unable to answer this question. However, the research inventory and database created by this project can be used for this next step. In addition, our work and discussion on health priorities similarly facilitates future study of the overlap and gaps in public health research in Mongolia.

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Appendix A – Bibliography of Included Studies

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Appendix B - Annotated Bibliography

1. Enkhargal, G., N. Suvd, et al. (2003-2004). Health risk assessment of indoor air quality Ulaanbaatar, Mongolia, Public Health Institute; Mongolian Ministry of Health; WHO Collaborative Centre for Environmental Health Impact Assessment, School of Public Health, Curtin University of Technology: 86 pages.

Purpose: Phase 1 - To determine the prevalence of respiratory diseases in children between 2 and 8 years of age, and to describe some of the environmental factors to which those children are exposed (type of residence, type of heating used); Phase 2 - To establish the extent to which differences in the amount of exposure to indoor environmental factors in dwellings in Mongolia can explain the risk of the development of bronchitis in winter. Also, to determine the extent to which other characteristics of the child, and of the house influence risk of bronchitis and modify the relationship between indoor air pollutants and bronchitis. **Method:** Phase 1 - Cross-sectional survey study (structured interview); Phase 2 - Case-control study including air quality monitoring and air tightness testing. **Target population:** Children aged 2-8 years living in Ulaan Baatar city. **Sample:** Phase 1 - 500 children aged 2-8 was surveyed in the Sukhbaatar and Bayangol districts in UB. About equal numbers of males and females by age and by type of house. Phase 2 - 75 cases age 2-8 with confirmed chronic bronchitis and 75 controls; study carried out in entire urban area of UB city (8 districts). **Findings**: Phase 1 - 19% of children studied had bronchitis and 1.4% had asthma. 77.8% had respiratory symptoms and morning cough and phlegm were common. Most of the children in ger areas had bronchitis. The frequency of respiratory symptoms was higher in children who lived in gers and houses than that of those living in apartments. Phase 2 - The contents of carbon dioxide and particulate matter were higher in gers and houses than apartments. There is an association between carbon monoxide and dust and bronchitis in children. The concentrations of particulate matter were 4.1 times above the recommended WHO human exposure levels in ambient air. Concentrations of this pollutant are higher in gers and houses than in apartments. No significant correlation between IAZ and air tightness was found in the selected houses. Recommendation: First recommendation is to improve monitoring of outdoor air quality pollutants, develop a national standard on indoor air quality.

2. Odgerel, D., B. Tsagaanhuu, et al. (2003-2005). Hygienic assessment of bottle water quality. Ulaanbaatar, Mongolia, Laboratory of Professional Inspection Authority of the Capital City (Ulaanbaatar): Abstract.

Purpose: To assess chemical and microbiological contamination of bottled water produced in UB factories. **Method:** Analysis of chemical and microbiological content of bottled water samples. **Target population:** Consumers of bottled water produced in UB factories. **Sample:** 160 bottled water samples from 25 factories in UB. **Findings:** 61.9% and 37.7% of all analyzed

water did not meet standard requirements by chemical (i.e. organic pollutants) and microbiological parameters, respectively. Three-fifths of all analyzed bottled water samples were polluted with microorganisms and do not meet the drinking water quality standard (i.e. total plate count and E. coli). The bottled water produced using pumped well water is more polluted than those produced using tap water sources.

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Purpose: To assess the work of the pharmaceutical sector in Mongolia and the progress of implementation of the National Medicines Policy of Mongolia, including quality, supply and management; based on the recommendations of the first assessment in 1999. **Method:** Comparison of the country's national medicines policy indicators to those of 1999. **Findings:** Most of the recommendations based on the first assessment in 1999 have been implemented (development/endorsement of 1998 Law of Medicines, establishment of pharmacy department and initiatives in promoting rational use of medicines for consumers and health workers) but there is a need for greater efforts to ensure that drugs are safe, effective, in good quality and are used properly.

4. (2004). Prevalence and current situation of iron deficiency anemia among pregnant women in different aimags and districts of Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Public Health Institute: 9 pages.

Purpose: To demonstrate the effectiveness in Mongolia of implementing WHO recommendations to prevent iron deficiency anemia in pregnant women. **Objectives:** To determine prevalence of iron deficiency anemia among pregnant women; to assess knowledge and attitudes of pregnant women about prevention of iron deficiency anemia. **Method:** Cross-sectional survey (including questionnaire, clinical observations, laboratory test of blood samples). **Target population:** pregnant women in Mongolia who live in aimags where the WHO pilot project "Mother-Friendly Hospital Initiative" has been carried out. **Sample:** 689 pregnant women aged 17 to 41 years randomly sampled from 2 aimags and 2 districts of UB city. **Findings:** Found that according to the WHO anemia in pregnancy definition, 35.5% of all pregnant women included in the survey were anemic - moderate prevalence. The prevalence of anemia had increased by 12.4% since 2001 study. Of the aimags/districts studied, the prevalence was found to be highest (56.8%) in UB's Bayangol district. 22.1% of pregnant women consumed iron supplementation but a majority of these women used iron supplements irregularly and incorrectly. 42.6% of the anemic women had had ended their previous pregnancy by abortion. Most (83.7%) pregnant women knew that they should use iron supplementation during pregnancy.

5. Baigalmaa, C., K. Davaajav, et al. (2004). 100% Condom Use Programme: Experience from Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; National Center for Communicable Diseases; Global Fund; Trust and Hope NGO of Darkhan-Uul City; National AIDS Foundation; Marie Stopes International.

Purpose: Pilot study in Darkhan-Uul province, aims to prevent HIV/AIDS/STI among the general population through the promotion and support of condom use among sex workers and clients. **Method:** Conducting advocacy among key stakeholders and relevant organizations, collaboration of local authorities with entertainment establishments and sex workers to create conditions that ensure condom use, creating easy access to condoms at all hotels, conducting surveys and interviews with sex workers and interviews with their male clients, monitoring the number of condoms distributed through hotels/bars/etc. **Target population:** Provincial Governor's Office, Provincial Professional Control Agency, Law Enforcement agencies, Health Organizations, NGOs, Entertainment Establishments, Sex workers. **Sample:** 66% of sex workers (200 out of 300) were involved in the program. **Findings:** After the first year, rates of STI among sex workers were decreased by 18%, and condom use had increased to 87%. Found that STI prevalence in the general population of Darkhan-Uul has decreased over the last 2 years. There was an increase in condom sales of 57% between 2002 and 2004. Police harassment has reduced as a result of changes in their attitudes; crime prevention has increased and there has been no charges to sex workers since 2002. Cooperation and commitment of key stakeholders was the most important factor in the success of this program.

6. Baigalmaa, C., C. Urtnasan, et al. (2004). The Second Round STI/HIV Sentinel Surveillance in Mongolia, Mongolian National Center for Communicable Diseases: Abstract.

Purpose: To conduct second-generation HIV and STI serosurveillance and behavioural assessment. **Method:** Behavioural surveillance. **Target population:** Vulnerable groups (sex workers, men attending STI clinics, mobile population, and newly diagnosed TB patients) and the general population in UB City and 7 provinces **Sample:** 2887 people were tested. **Findings:** No HIV positive cases were identified. 5.6% were found to have syphilis and prevalence among sex workers in Selenge reached 38%. Condom use was below 25% for both sex workers and the general population and 42% of the respondents said that they did not attend an STI clinic when they developed STI symptoms. Despite low levels of HIV within the population, the potential for HIV transmission is high with several reported risky behaviours.

7. Battuvshin, B., G. Sarangoo, et al. (2004). Prevalence of HCV (hepatitis C) infection among the labor enabled population (Mongolia's labour force). Ulaanbaatar, Mongolia, Health Sciences University of Mongolia: Abstract.

Purpose: To establish the prevalence, define modes of transmission and identify factors influencing the spread for some infectious diseases transmitted sexually and parentally among Mongolia's labour force population. To recommend practical activities for the prevention of such infectious diseases through the determination of the causative agents of these infections. **Method:** Cross-sectional medical record review (involving medical examinations and blood test results). **Target population:** Mongolian labour force population aged 15-53 years. **Sample:** 1137 subjects who attended a medical examination by order of the Labour Force Mediation Bureau from December 2003-March 2004 were enrolled (477 females, 660 males, 935 urban) and their data was collected from their medical examination record. **Findings:** 13.72% of the subjects were positive for HCV antibody. No differences found in HCV rate between males and females not between urban and rural populations. The highest rate was found in the over 35 age group compared to under 25 and 26-35. Rates of HCV positivity differed by level of education - a higher HCV rate was found in subjects with special and high school education compared to subjects who completed university and college education.

8. Bayansgalan, G., D. Naranbat, et al. (2004). "Male infertility: risk factors in Mongolian men." Asian Journal of Andrology: 305-311.

Purpose: To determine the most common risk factors of male infertility in Mongolian men attending an infertility clinic. **Method:** A prospective, case-control study. **Target population:** Mongolian men attending an infertility clinic. **Sample:** 430 men who sought their first infertility evaluation between 1998-2002 in the State Research Center on Maternal Child Health in Ulaanbaatar, Mongolia (191 with abnormal semen and 239 with normal semen profile). **Findings:** A history of pathology involving testicular damage appeared to have the strongest impact on male infertility in Mongolia. STIs have less impact on semen quality except when complicated by orchitis, epididymitis and vassal obstruction. Recommendations: Further study is needed to explore testicular injury and its consequences among the infertile men and the general population in Mongolia.

9. Bayasgalan, G., D. Naranbat, et al. (2004). "Clinical patterns and major causes of infertility in Mongolia." Journal of Obstet. Gynaecol 30(5): 386-393.

Purpose: To determine the clinical patterns and major causes of infertility in Mongolia, based on clinical and lab findings of both partners. **Method:** Detailed history and complete physical exam of both partners. **Target population:** Infertile couples of reproductive age. **Sample:** 430 couples of reproductive age attending infertility clinic at the State Research Center on Maternal Child Health in UB. **Findings:** 46% of infertility cases were due to a female factor and 26% were due to a male factor. 10% had no demonstrable cause and 19% had infertility diagnosed in both partners. The secondary infertility level is higher in Mongolia than in the rest of Asia and is closer to the level in Africa (which has the highest level of infertility in the world). 44% of men

and 34% of women reported that they have had an STI in the past. Of the definite causes of infertility, most were preventable, especially in men.

10. Buyankhishig, B., B. Tserelmaa, et al. (2004). Acquired drug resistance survey in the treatment and chronic cases of tuberculosis in Mongolia. Ulaanbaatar, Mongolia, National Center for Communicable Diseases: Abstract.

Purpose: To determine the prevalence of resistance to major anti-tuberculosis drugs among tuberculosis patients who have been treated previously. **Method:** Sputum specimens collected and tested for drug susceptibility from smear-positive TB patients identified in 2nd category treatment cases and smear positive chronic cases. **Target population:** Tuberculosis patients who have been previously treated. **Sample:** All TB Diagnostic Centers from 21 aimags and 8 districts participated between June 2002 and September 2004. 256 specimens collected, 206 found to be culture positive, and 125 sent to drug susceptibility testing. **Findings:** Resistance to any of the four major drugs (streptomycin, isoniazid, rifampicin, and ethambutol) was as high as 62.4%. Among prisoners (13 cases), 12 were resistant to at least 1 drug and 8 had MDR-TB. MRT was high at 30.4%. Drug resistance rates were higher in youth and middle-aged parents than in the elderly and children. Females tended to have higher resistance than males.

11. Davaadulam, B., N. Saijaa, et al. (2004). Determination of heavy metals in traditional food dried meat. Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine the environmental risk factors involved in the preparation of traditional food in Mongolia. **Method:** Cross-sectional study. Measurement of metal contents of various kinds of dried meat. **Target population:** Consumers of dried meat in Mongolia. **Findings:** Mongolian traditional dried meat is not ecologically dangerous.

12. Dietrich, S., M. Beck, et al. (2004). "The relationship between public causal beliefs and social distance toward mentally ill people." Australian and New Zealand Journal of Psychiatry 38: 348-354.

Purpose: To investigate the nature of the relationship between public causal beliefs and social distance toward people with mental disorders, particularly schizophrenia and depression. **Method:** 3 structured interviews were conducted in 3 locations (Germany, Russia, Mongolia). **Target population:** citizens aged 18 and older living in non-institutionalized settings **Sample:** 950 interviews; samples drawn using three stage random sampling procedure - electoral wards, households, individuals. **Findings:** Acute stress (life event) was seen as the cause of schizophrenic disorder; Mongolians and Russians were more likely than Germans to blame their families for depression but more likely to blame the individual for schizophrenia. There is a positive relationship between

biological causal beliefs and social distance towards people with schizophrenia and depression.

13. Dulamsuren, S., S. Oyunbileg, et al. (2004). Training Needs of Bag Feldshers. Ulaanbaatar, Mongolia, Department of Human Resource Development, Directorate of Medical Services (DMS): 37 pages.

Purpose: To evaluate knowledge of feldshers on public health and primary health care (PHC), and to determine their needs for training. **Method:** Needs assessment survey (self-administered questionnaire as well as discussion group). **Target population:** Mongolian bag feldshers and the population they provide health care to, and heads of soum hospitals. **Sample:** 2 soums and 4 bags from each aimag were selected randomly. 100 feldshers and 43 soum doctors participated in the survey and there were 92 respondents (70% response rate). 51 participants (31%) took part in a discussion group. **Findings:** Most bag feldshers who participated in the survey had know about 'The State Policy on Public Health', but their knowledge on implementation of PH activities was poor. Bag Feldshers had insufficient knowledge on main principles and elements of PHC and confused it with medical care. Also, lack of understanding about endemic diseases was evident. Most of them had a wrong understanding about the health promotion priorities. There is low percentage of attendance to postgraduate training. Suggests a number of training needs.

14. Edstam, J., N. Dulmaa, et al. (2004). "Exposure of hepatitis B vaccine to freezing temperatures during transport to rural health centers in Mongolia " Preventive Medicine 39: 384-388. Hepatitis B

Purpose: To determine if HBV vaccine is damaged to do freezing temperatures during transport to rural health centers. **Method:** 3M Freeze Watch monitors were placed in physical contact with the vials of HBV vaccine in each vaccine transport. These were visually inspected by receiving vaccine personnel who would report by phone to the personnel at the origin whether freezing had occurred. **Sample:** Data from 181 transports, 4 data sets. **Findings:** Transport from UB to the aimag stores was very successful with only 1.6% freezing of HBV vaccine, however, there was 19% freezing in the transport from aimag to soum (indicated by "burst" 3M Freeze Watch). The mean duration for "intact" trips (not freezing) was 4.2 hours compared to 5.9 hours for trips in which freezing occurred.

15. Fine, A. (2004). Epidemiology of brucellosis in livestock and humans in Mongolia, Michigan State University. PhD: 181 pages.

16. Gantulga, D., R. Tuul, et al. (2004). Determination of immunity level against vaccine preventable diseases among population; The tactics of supplementary and booster immunization to prevent epidemics of vaccine preventable infectious diseases., Mongolian National Center for

Communicable Diseases, Health Sciences University of Mongolia: Abstract.

Purpose: To determine the immunity level against vaccine preventable diseases (measles, diphtheria, tetanus, pertussis and HBV) and to derive further measures to be done to decrease prevalence of infectious diseases; To determine the population with low immunity or without immunity and develop a tactic of supplementary and booster vaccination. **Method:** Questionnaire and analysis of blood samples. **Target population:** People aged 0-60 in UB City, Arkhangai, Dundgovi, Sukhbaatar and Khovd aimags **Sample:** 1200 people from these regions. **Findings:** The overall coverage rate of vaccinations was 95-98%. Of 194 children under 59 months, 71% were fully covered by immunization and 13% were without registration cards. Of the children without registration cards, 56% had tetanus antibodies. At the bagh ad soum levels, immunity to tetanus, and pertussis is lower than in aimag centers and UB. Only 0.7% of the 706 people tested for diphtheria had no antibodies. 10.9% had no antibodies to pertussis and 17% had no antibodies for measles.

17. Gerljargal, B., D. Enkhmyagmar, et al. (2004). The prevalence of iron-deficiency anemia in children in Mongolia. Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine the prevalence of anaemia and iron deficiency in children under the age of five, and the proportion of iron-deficiency anaemia (IDA) in relation to all forms of anaemia. **Method:** Cross-sectional study (hemoglobin levels of children measured using photometer HEMO-CUE and serum ferritin determined by enzyme-immunoassay analysis). **Target population:** Mongolian children under the age of 5 years. **Sample:** Multistage, random sample. 1241 children under the age of 5 were selected from 20 aimags and 8 districts. **Findings:** The prevalence of anaemia was <moderate> in young children of Mongolia by the WHO criteria. The prevalence of anaemia was close to a <high level> among children aged between 6 - 17 months who were consuming weaning food. One fifth of young children (22.3%) of Mongolia had iron deficiency and 37.6% of the children had a marginal iron level status. 7.3% of total children had iron deficiency anemia and 79% of anemia was caused by iron deficiency.

18. Janes, C. and O. Chuluundorj (2004). "Free Markets and Dead Mothers: The Social Ecology of Maternal Mortality in Post-Socialist Mongolia." Medical Anthropology Quarterly 18(2): 230-257.

Purpose: To assess the impact of Mongolia's transition from a socialist to a capitalist market economy on the multi-level "causal assemblages" that affect women's health. **Method:** Analysis of surveys on household economics and health care utilization in rural northern Mongolia, interviews with MOH officials, records on maternal mortality deaths, interviews with physicians and midwives and case studies of maternal mortality based on records and interviews. **Target**

population: Women who have died during/as a result of childbirth. **Findings:** Maternity waiting homes are not being used as consistently as they were in the past. The main cause of maternal mortality is post partum hemorrhage and maternal mortality rates are highest between February and July. About half of all of these deaths were attributed to a mistake by the physician or midwife, delay in referral to higher level facility and long distance of travel to a health care centre. Death was more likely to occur at lower level and rural facilities and victims were mainly herders. Rates of mortality were higher in the western part of the country.

19. Jargalsaikhan, D. and e. al. (2004). Needs assessment on advocacy for health promotion. Ulaanbaatar, Mongolia, PROLEAD team of Mongolia (NCHD Health Promotion Department and ThaiHealth Health Promotion Foundation); National Center for Health Development: 22 pages.

Purpose: To assess the needs on advocacy for health promotion in Mongolia. **Method:** Needs assessment survey (review of the current situation and health status of the population; assessment of IEC material and training conducted by main players on health promotion; round table discussion on advocacy needed for creating a supportive environment). Recommendations: Seed funds should be made available for sustainable health promotion activities including advocacy and social mobilization. In the budget for the Health sector there should be a specific line allocated to health promotion activities. Need to implement policy and reform in health sector to create supportive healthy environments. Examples of such policy could include: healthy workplace policy to decrease smoking and increase physical activity. Need to develop advocacy skills of the main players and improve HP infrastructure, and financing through good governance in Mongolia.

20. Jargalsaikhan, D., C. Erdenetuya, et al. (2004). Needs assessment on physical activity at the job place. Ulaanbaatar, Mongolia, Directorate of Medical Services; State Committee of Physical Culture and Sport: 45 pages.

Purpose: To determine the state of physical activity of people working in sedentary jobs; to estimate and monitor measurable levels of fitness of people working in sedentary jobs; to determine body weight (obesity) indicators for people working in sedentary jobs; to develop recommendations related to physical activity. **Method:** Needs assessment survey and focus group discussion. **Target population:** Mongolian adults with sedentary jobs. **Sample:** 602 people working in sedentary jobs took part in the survey from the Gloom bank, Directorate of Medical Services, Mongol Post Company, Burte Company, Administrative Department of the Governor of the City of Ulaanbaatar, Ministry of Finance and Economy, and the Health Department of the Bayanzurkh District; 82 people took part in the discussion groups.

21. Kohrt, B. A., D. J. Hruschka, et al. (2004). "Distribution of distress in post-socialist Mongolia: a cultural epidemiology of yadargaa." Social Science and Medicine. 58: 471-485.

Purpose: To determine the distribution of yadargaa (a fatigue-related illness in traditional Mongolian medicine, results of a lifestyle imbalance) and its association to socioeconomic changes under capitalism; to identify risk groups; to estimate point prevalence; to assess the distribution of meanings and interpretations of yadargaa. **Method:** ethnographic interviews; cross-sectional study methods for identification of risk groups, prevalence, and distribution. **Sample:** Interviews: 43 clinical patients and 20 professionals of traditional healing, traditional Mongolian medicine, and Russian-based medicine; 30 lay community interviews in Ulaanbaatar and in a province in the Gobi desert; epidemiology surveys: 194 individuals. All participants in both sections were 18 years or older. **Findings:** Nearly half of the epidemiological sample suffered from yadargaa. These yadargaa sufferers felt that they benefited less than non-yadargaa subjects from the current socioeconomic changes. Yadargaa sufferers were predominantly women, the elderly, and urban residents. **Conclusion:** yadargaa strongly associates with disenfranchised groups in the capitalist economy. As a culturally constructed indicator of quality of life, yadargaa is a window into the lives of women and men in post-socialist Mongolia.

22. Kohrt, H., B. Kohrt, et al. (2004). "An Ecological-Transactional Model of Significant Risk Factors for Child Psychopathology in Outer Mongolia." Child Psychiatry and Human Development 35(2): 163-181.

Purpose: Investigates the development of child mental illness as sequelae of cultural beliefs and value systems using an ecological-transactional model of unique risk factors in Post-socialist Mongolia. **Method:** Questionnaire-based diagnostic scores for ADHD, CD, oppositional defiant disorder (ODD), major depressive disorder (MDD), generalized anxiety disorder (GAD), separation anxiety disorder (SAD); Mood and feeling questionnaire; caregivers asked open-ended questions about the household, community, environment, disciplinary practices. **Sample:** 99 boys aged 3-10 years attending classes from kindergarten to fourth grade - 16 institutionalized children, 11 urban poor, 62 urban middle class, 10 semi-rural. **Findings:** The ecological-transactional model of risk factors for child psychopathology is an effective tool in a non-Western population. Modelling supports that there is a direct influence of family variables, physical punishment, and quality of marriage on behavioural disorders. Caregivers who believe that violence is acceptable as discipline were more likely to have children with behavioural disorders. Contact with extended family is negatively associated with domestic violence but large household size is positively associated with domestic violence. There is no directionality to these findings; behavioural disorders may be the cause or effect physical punishment and beliefs.

23. Komatsu, F., K. Hasegawa, et al. (2004). "Comparison of electrocardiogram findings and lifestyles between urbanize people and ger-living people in Ulaanbaatar, Mongolia." Atherosclerosis 17: 101-108.

Purpose: To use daily food investigations, anthropometric measurements and serum lipid analyses to determine if these are related to ECG abnormalities in ger-district residents. **Method:** Food frequency questionnaire, anthropometric measurements and serum-lipid analysis. **Target population:** Urban residents and ger-living people in UB. **Sample:** 256 people (142 "urbanized", 114 ger living). **Findings:** Urbanized residents eat a more "Western style" diet while ger residents have a more traditional diet with few fruits and vegetables, had a higher percentage of fat in their diet, used more salt, most males in this group were smokers and routinely drank vodka ("urbanized group drank more whisky). "Urbanized" males had higher BMI, %body fat and body weight but lower hand grip power. This puts the urbanized group at greater risk for left-ventricular hypertrophy (connected to the western style diet).

24. Logez, S., G. Soyolgerel, et al. (2004). "Rapid assessment of injection practices in Mongolia." American Journal of Infection Control 32(1): 31-37.

Purpose: To make an initial step towards a safe and appropriate injections policy in Mongolia. **Method:** Rapid assessment using the WHO's Injection Practices: Rapid Assessment and Response Guide. This includes stakeholder interviews with people that could play a role in the future initiative for safe and appropriate injections. **Sample:** Convenience sample of 20 health care facilities in 4 aimags and UB; in each facility 1 or more prescribers and 1 or more injection providers selected at random and 3 people from the community. In total: 28 injection providers, 21 prescribers, 65 persons from the general population. **Findings:** 48% of the persons from the general population reported having had at least 1 injection in the last 3 months. The 21 prescribers reported an average of 1905 prescriptions per week and of these 14% would include at least one injection. The 28 providers reported an average of 2098 injection per week; and of these 78% were for therapeutic reasons and 22% were for immunization. Half of the population were unaware that they could acquire HIV through unsafe injections; only 5% of prescribers were aware of the risk of HCV infections with unsafe injections.

25. Munkhdelger, C. (2004). Survey of medicine prices, availability, affordability and price components in Mongolia. Ulaanbaatar, Mongolia, Pharmaceutical and Health Devices Department, Ministry of Health: 50 pages.

Purpose: To measure the prices and availability of medicines in Mongolia using an international standardized methodology. **Objectives:** To measure prices of selected medicines in different sectors, geographical areas, health facilities and pharmacies; to identify differences in the prices of brand name products and generic equivalents; to identify components of medicines prices; to

assess the affordability of the medicines. **Method:** Cross-sectional survey based on a methodology developed by the WHO and Health Action International was used to measure prices of medicines and compare prices of medicines in different health sectors (public, private, other - revolving drug fund). **Sample:** A total of 52 pharmacies were surveyed - 16 in UB city, 12 in each aimag. A total of 33 medicines were included in the survey - 18 core medicines and 15 were added by researchers as a supplementary list. **Findings:** Found that of 33 medicines surveyed only one (ceftriaxone) was found in brand name form (a key indicator of comparative medicine surveys). This is related to Mongolia's limited market and foreign trade scope as well as poor affordability of medicines by customers.

26. Naranbat, N., S. Naryad, et al. (2004). The study of scarring after BCG vaccination among the children, Mongolian National Center for Communicable Diseases: Abstract.

Purpose: To determine the quality and efficacy of BCG vaccine by appearance of normal scars, to identify adverse reactions to the vaccine and to assess the administration technique of the vaccine. **Method:** Visual inspection of scars, measurements of scar diameter. **Target population:** Children born between 1996 and 2002 in UB city districts **Sample:** 2670 children **Findings:** 97% of children in 9 districts of UB were immunized and 98% had scars. 94% had normal scars while 4% were abnormal. 59% of injection sites were not correctly selected. The quality of the vaccination administration has improved form the previous study conducted in 1997 and the number of children immunized has increased.

27. Otgooloi, K., D. Dariimaa, et al. (2004). Prevalence of diabetes among the elderly, Health Sciences University of Mongolia: Abstract.

Purpose: To identify prevalence of diabetes among the elderly. **Method:** Glucose tolerance test to diagnose type 2 diabetes. **Target population:** People over 60 in Songino Khairhan district. **Findings:** Diabetes was diagnosed in 4.3% of the sample. 12% had impaired glucose tolerance and 69% of people with diabetes had been exposed to 2 or more risk factors.

28. Oyunchimeg, U. and B. Burmaa (2004). Prevalence of neonatal congenital malformations in Ulaanbaatar City. Ulaanbaatar, Mongolia, Maternal and Child Health Research Center; Ministry of Health: Abstract.

Purpose: To determine the prevalence of neonatal congenital malformations in Ulaanbaatar city; to develop and maintain a case registry for use in epidemiologic and genetic studies. **Method:** Cross-sectional descriptive study of medical records (retrospective study 1990-1994, 1995-1999, and prospective study 2000-2004). **Target population:** Babies born in Ulaanbaatar city. **Sample:** 341 babies born in Maternity Homes 1, 2, and 3 in Ulaanbaatar city (182 born between 1990-1999, 159 born between 2000-2004). **Findings:** The

prevalence of neonatal malformations was 1.48 per 1000 live births in 1990-1999 and 2.15 in 2000-2004. The anatomical organs most commonly affected were the cardiovascular (19.5%), gastrointestinal (18.2%), and central nervous (10.1%) systems.

29. Oyungerel, M. and N. Tsend (2004). Method of prevention of new hepatitis viruses, National Center for Communicable Diseases: Abstract.

Purpose: To determine if GBV-C/HGV requires specific prevention and treatment techniques. **Method:** Patients were tested for GBV-C/HGV PNA using PCR. **Sample:** 869 subjects - 434 healthy persons, 256 "high risk" (i.e. IDU, STI patients), 118 acute viral hepatitis patients. **Findings:** GBV-C/HGV PNA were higher in high risk groups and GBV-C/HGV positive persons were infected mainly through parenteral and sexual ways. GBV-C/HGV infection in patients with acute viral hepatitis presented as a mix of infections (hep b, c, d). Monoinfection with GBV-C/HGV is not hepatotropic. Recommendations: GBV-C/HGV does not need specific prevention and treatment measures.

30. Radnaabazar, J., D. Enkhjargal, et al. (2004). Screening for syphilis in antenatal clinics and major causes of increasing congenital syphilis in Ulaanbaatar, Mongolia. Ulaanbaatar, Mongolia, Maternal and Child Health Research Center: Abstract.

Purpose: To document the incorporation of the national program of 'Elimination of Maternal and Congenital Syphilis' in the Mongolian Public Health System. **Objectives:** to assess the availability and the quality control procedures for antenatal syphilis screening at all ANC clinics and laboratories in UB; to investigate the completeness of the management of serologically positive pregnant women who are admitted for delivery in the study hospital; to conduct a case-control study comparing the history of syphilis screening of mothers with live born infants or stillbirths with congenital syphilis and controls who gave birth to non infected infants from the same hospital. **Method:** Survey assessment of ANC clinics and labs in UB; review of hospital patient management; interviews; case-control study (record review, autopsies). **Target population:** Pregnant women utilizing the Public Health System in Ulaanbaatar city. **Findings:** 95.2% of all pregnant women who delivered babies with congenital syphilis received antenatal care; 33.4% of them received early antenatal care. 37.5% of the 8 laboratories studied were found to not follow the standard quality control procedures. Treponemal pallidum haemagglutinin (TPHA) was not routinely used to confirm RPR tests in 33.5% of laboratories. Late presentation at first ANC visit (61.9%) during pregnancy contributes to the problems of syphilis treatment. The results of the interviews showed that most women reported that the health care provider did not explain to them why their blood was taken. Most of the cases did not finish the treatment before delivery.

31. Rak, K. and C. R. Janes (2004). "Reproductive Health in Post-Transition Mongolia: Global Discourses and Local Realities." Perspectives on Global Development and Technology 3(1-2): 171-196.

Purpose: To explore the disjuncture between global discourses on family planning and reproductive health and the locally and culturally contingent experiences of Mongolian women in contemporary Mongolia. **Method:** research conducted as part of a larger study of the impact of global health reform on access to health care services by low-income Mongolians. Self-administered questionnaires; semi-structured face-to-face surveys; qualitative key respondent interviews; collection of statistics on birth control usage and abortion rates from clinical settings. **Target population:** Mongolian adult women. **Sample:** survey: 91 women ages 17 - 63 years; interview: 70 women aged 19 to 58 years; key respondent interviews: 27 health care providers and policy makers. **Findings:** Findings suggest that reproductive health programs based on the global assumptions that technological methods of birth control are superior to traditional methods, use of these methods is more modern and "rational" then alternatives, and abortion should not be considered a form of birth control, fail to consider the local cultural contexts of reproductive decision-making address women's needs, and are therefore seriously flawed.

32. Sarantsetseg, T. and B. Oyungerel (2004). The prevalence of respiratory system diseases among elderly people (above 60 y.o.) in Songino-Khairhan District, Ulaanbaatar, Medical Research Institute: Abstract.

Purpose: To determine the prevalence of respiratory system diseases among elderly in Songino-Khairhan District, UB **Method:** Cross-sectional survey; random sampling. **Target population:** Elderly people in Songinokhairhan District, UB **Sample:** 1000 people **Findings:** Average prevalence rate of respiratory diseases among people over 60 is 338 per 1000 people. Chronic and indefinite bronchitis has the highest prevalence. Men have more respiratory illness than women.

33. Shiwaku, K., E. Anuurad, et al. (2004). "Overweight Japanese with body mass indexes of 23.0-24.9 have higher risks for obesity-associated disorders: a comparison of Japanese and Mongolians." International Journal of Obesity 28: 152-158.

Purpose: To analyze parameters constituting obesity-associated disorders in overweight Japanese and Mongolians with body mass index (BMI) of 23.0 - 24.9, and to assess the suitability for Asians of the Regional Office for Western Pacific Region of WHO criteria pertaining to obesity. **Method:** Cross-sectional study in a workplace setting (anthropometric and metabolic measurements taken). **Target population:** Japanese and Mongolian adults aged 30-60 years. **Sample:** 749 Japanese aged 30-60 years working in manufacturing factories and offices in Shimane Prefecture, Japan in 1999-2002; and 257 Mongolians aged 30-60 years chosen randomly from lists of workers who worked

at two large companies (cashmere factory and power plant) in Ulaanbaatar in 2001. **Findings:** The Mongolian population had a higher prevalence of obesity and a higher level of abdominal fat, but a lesser gradation of dyslipidemia than did the BMI-matched Japanese. Conclude: A universal cut-off point is inappropriate for comparisons of obesity characteristics among Asian ethnic groups. Found that while the WPRO criteria are suitable for Japanese, the WHO criteria are more appropriate for Mongolians.

34. Sovd, T., B. Lipovsek, et al. (2004). Assessment of adolescent-friendly health services initiative in Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; UNFPA; WHO Pacific Region Office: 80 pages.

Purpose: To evaluate the effectiveness of the health component of a three-year (2001-2004) UNF-funded pilot project entitled "Improving the Outlook of Adolescent Girls and Boys in Mongolia". The specific objective of the assessment was to evaluate the quality and delivery of health services for adolescents in project versus control areas of UNF-project based on AFHS Model. **Method:** Assessment of the Mongolian application of AFHS criteria through facility observation, staff interview and client survey; assessment of health service utilization by adolescents at the population level through a separate in-school adolescent follow-up survey. **Target population:** Mongolian adolescents aged 10-19 years. **Sample:** 5 projects sites and 3 control sites selected for assessment of application of criteria (82 facilities, 154 staff, 1177 clients), and 3739 in-school adolescents from 14 projects schools and 9 control schools selected for assessment of health services utilization. **Findings:** Found significant improvements in physical environment of health facilities and provision of health services for adolescents, positive changes in health providers' competence and attitude, an increased awareness of such previously neglected issues as patient consent, confidentiality and client rights among health care workers and increased utilization of services by adolescents.

35. Tsetsegdary, G., A. Tovuudorj, et al. (2004). The Present Situation of Health Care for Patients with Epilepsy in Ulaanbaatar City, Mongolia, 2004. Ulaanbaatar, Mongolia, Ministry of Health; World Health Organization; Health Sciences University of Mongolia; Center for Mental Health and Narcology; Mongolian Epilepsy Society; Mongolian Mental Health Association: 48 pages.

Purpose: To assess the current situation and trends relating to the health care of patients with epilepsy in Ulaanbaatar City. **Method:** Questionnaire given to patients and patient information obtained from physician. **Target population:** Patients diagnosed with epilepsy at the participating hospitals in Ulaanbaatar. **Sample:** 1565 epilepsy patients. **Findings:** The majority of epilepsy cases were caused by head trauma (different conclusion than previous study by Annegers and Hauser). The majority of epilepsy patients were young people with low levels of education. The prevention and monitoring program for epilepsy has not been

sufficient particularly for women and children. There was no monitoring of blood levels to ensure proper dosage of drugs. The surgical treatment for epilepsy is not practiced in Mongolia.

36. Tsetsegdary, G., D. Zulgerel, et al. (2004). Prevalence of streptococcus A, tonsillitis and rheumatic fever among children in Ulaanbaatar City. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Health Sciences University of Mongolia: 39 pages.

Purpose: To assess the prevalence of streptococcal tonsillitis and rheumatic fever among children in UB city and to determine whether or not there exists a correlation with rheumatic fever among children. To assess the feasibility of early detection of streptococcus A infection using latex text in UB city. **Method:** A comparative cross-sectional survey to detect the cases of streptococcal pharyngotonsillitis (SPT) using a set questionnaire; detailed medical examination (clinical exam and laboratory investigation). **Target population:** Children in Ulaanbaatar city. **Sample:** Students selected from 2 schools in UB (one school located in center of city with good supply of heating, clean water, etc; other school in suburbs without heat or water supply). 200 students aged 10-16 years selected from each school. **Findings:** The prevalence of SPT in the school located in the city was found to be 15.07% (30 cases). The prevalence of SPT in kids from suburban school (ger district) was 50.24% (101 cases). Rates 3 times higher in ger district than city center school. Many factors related to suburban children getting and transitioning into chronic phase: low level of parental education, oral hygiene, living in ger district, number of family members, low average monthly income. 60% of children with SPT do not see a doctor, 73.9% interrupted treatment, 72.8% treated without doctor's prescription. Latex assay can be used in early detection of streptococcal infection.

37. Tumendemberel, B., B. Tserensodnom, et al. (2004). Assessment of Master of Public Health Training in Mongolia. Ulaanbaatar, Mongolia, Mongolian Public Health Professional Association; Mongolian Foundation for Open Society: 41 pages.

Purpose: To describe the current situation and assess the requirements for PH training in Mongolia, particularly in relation to Master level training and to suggest the strategies for its improvement. **Method:** A situation analysis of the public health situation in Mongolia; a comprehensive review/assessment of training needs in public health in general. Tools: Literature review of international reference materials; review of all relevant documents including national programs, laws and regulations; focus group discussions; individual interviews with graduates of the School of Public Health and donors. **Conclusion:** There is an urgent need for generating a critical mass of professionals within the health system with a broad understanding of public health including the management of health issues in order to support the reform process, to lend support and provide vital contributions to the implementation and evaluation of health care system reforms.

38. Tuul, R., D. Gantula, et al. (2004). Study of results of measles vaccination, National Center for Communicable Diseases: Abstract.

Purpose: To determine immunity status against measles in the population of Mongolia. **Method:** Sera collected and tested for specific IgG against measles. **Target population:** Population of Mongolia **Sample:** 1185 sera samples collected from UB, Arkhangai, Dundgovi, Sukhbaatar, Khovd. **Findings:** 83.5% of sample had specific IgG against measles. 16.5% did not. The highest levels of antibodies were in people aged 15-19 and 35-40. The antibodies were found in about 30% of children who have not yet received the vaccine.

39. Tuya, M., L. Narantuya, et al. (2004-2006). Nutritional status of Mongolian children and women: 3rd National Nutrition Survey Report. Ulaanbaatar, Mongolia, Nutrition Research Center, Public Health Institute; UNICEF; Ministry of Health; World Health Organization; Academy of Health Management: 150 pages.

Purpose: to assess the current nutrition status of children, especially children b/w 6-59 months old, and women of reproductive age and to develop a justification for the further improvement of nutrition in Mongolia. **Method:** Cross-sectional survey (nutrition methodology acknowledged internationally and proposed by the American CDC and adapted for Mongolian conditions); survey included questionnaire, physical examination, anthropometric measurements and laboratory analysis. **Target population:** children aged 6-59 months, non pregnant women of reproductive age (15-49 years), 7-12 year old children, households. **Sample:** 60 clusters chosen from 342 clusters; 1247 6-59 months, 408 nonpregnant women; 1799 7-12 years; 1243 households selected. **Findings:** Found that 0.6% of all Mongolian children 6-59 months old suffered from acute malnutrition, 19.6% - from chronic malnutrition or stunting, and 6.7% were underweight. Compared to the results of the 1999 survey, malnutrition prevalence declined twofold, wasting declined 6 times and stunting by 5.0%. A significant decrease in the prevalence of severe forms of malnutrition was observed. There was a clear difference in malnutrition between boys and girls (higher in boys). Compared with other regions, the extent of malnutrition is higher in the western region. Many factors contribute to child malnutrition.

40. (2005). Ex-post evaluation study on maternal and child health project implemented by JICA between 1997-2002. Ulaanbaatar, Mongolia, Mongolian Public Health Professionals Association Japanese International Cooperation Agency: 22 pages.

Purpose: To evaluate the impact and sustainability of Maternal and Child Health project implemented by JICA between 1997-2002. This JICA project had two main components: IDD Elimination Project and EPI project. **Method:** Documentary review and key informants interview (To evaluate impact of IDD Elimination project - compared data of National Nutrition Survey III 2004 with that

of baseline and Nutritional Survey II 2000-2001; To evaluate impact of EPI project - compared most recent data with baseline data and data at the end of the project). **Target population:** Mongolian mothers and children. **Findings:** Found that the JICA project has significantly contributed to control of IDD in Mongolia. Also, found that the EPI project has successfully achieved its goals and greatly contributed to strengthening the EPI programme in Mongolia.

41. (2005). Impact evaluation of projects and programmes implemented in health sector. Ulaanbaatar, Mongolia, Swedish International Development Cooperation Agency (SIDA); UNDP: 84 pages.

Purpose: To evaluate he effectiveness of official development aid and its impact on population health. **Method:** Qualitative and Qualitative - Rapid health impact appraisal, health impact analysis to examine a policy/program/project's impact on health, health impact review to summarize published analyses of similar policies, interviews with selected key informants, focus groups. **Sample:** 20 projects (of 200 implemented between 1996 and 2002). Projects were chosen by coverage (preference for nationwide), timeline (preference for completion by 2003), specificity of project (preference for projects with narrow scope, i.e.. Reducing specific disease occurrence), projects with clearly defined goals, projects with importance to public health. In the end only 2 projects were selected for evaluation: DANIDA's TB Control and JICA's IDD Control Project. **Findings:** JICA's IDD project - positive improvements in goiter prevalence, but not at WHO target levels. The project has greatly contributed to decreasing IDD in Mongolia. TB Control project by DANIDA - positive impact on TB control by increasing detection and treatment rates, and has established standard guidelines for TB care and treatment however sustainability is questioned due to reliance on donor funds for drugs and lab reagents.

42. (2005). Knowledge, attitudes and practices on STIs/HIV/AIDS among young people in Mongolia. Ulaanbaatar, Mongolia, Mongolian Public Health Professionals Association; Ministry of Health. 64 pages.

Purpose: To assess the level of knowledge, attitudes and practices of young people aged 15-24 years with regard to STIs/HIV/AIDS in Mongolia. **Method:** Cross-sectional survey using quantitative and qualitative approaches. Self-administered questionnaire and focus groups. **Target population:** young Mongolians aged 15-24. Sampling frame: students in grade 8-10 at secondary schools, college and university students, and out of school young people. **Sample:** A three-stage sampling method was used to recruit participants. 1000 young people in UB and 2 aimags filled out the self-administered questionnaire. 100 young people participated in 10 focus group discussions. **Findings:** Overall findings of this study strongly support the need of improvement of quality of comprehensive reproductive health and sexuality education and the set-up of youth-friendly services covering school and out of school young people.

43. Altankhuyag, G. (2005). Fertility analysis of Mongolia: Fertility transition and its determinants in 1960—1998, University of Southampton (UK). PhD: 156.

44. Altanzagas, B., C. Tsolman, et al. (2005). The Hygienic Assessment of Spring Water Quality of Mongolia. Ulaanbaatar, Mongolia, Ministry of Health; World Health Organization; School of Public Health, Health Sciences University of Mongolia: 33 pages.

Purpose: To assess the quality of spring water used for drinking and domestic needs and to identify other factors that influence spring water quality in aimags and in Ulaanbaatar city. **Method:** Cross-sectional analytic design. Water was lab tested for chemicals and microorganisms. **Sample:** 127 springs chosen by non-probability random sampling; 99 from rural areas and 28 from Ulaanbaatar (5 from each aimag and district). **Findings:** Most of the springs studied did not have any protection or upgrade to the surrounding area. Human contamination of spring water has increased since the previous study (1998-2000).

45. Amidavaa, O., S. Kristensen, et al. (2005). "Sexually transmitted infections among pregnant women attending antenatal clinics in Mongolia: potential impact on the Mongolian HIV epidemic." International Journal of STD & AIDS 16(2): 153-157.

Purpose: Aim at defining the demographic and socioeconomic background of a national representative sample of pregnant women and obtain data on the prevalence and epidemiology of STIs among this population; To determine the attitudes towards HIV and prostitutes among law enforcement officials. **Method:** Cross sectional survey based on WHO guidelines; random selection of participating antenatal clinics; also lab tests for STDs including HIV. **Target population:** Pregnant women **Sample:** 2000 pregnant women (200 women from each of the 10 study sites). **Findings:** None of the participants tested positive for HIV. 20% of participants had C. trachomatis infection, 7% had T. vaginalis; 6% had N. gonorrhoea and 6% had treponemal antibodies. 30% had at least one STI. Among women under 25, 58% had at least one STI. STI rates were highest in the Dornod aimag and lowest in the Omnogobi aimag. Of the participants from the general population, 52% said that they know someone close to them has sex with prostitutes.

46. Ariunbileg, Z., D. Otgontuya, et al. (2005). Assessment of impact of traditional food and food products on health of the population, Mongolian Public Health Institute: Abstract.

Purpose: To determine the impact a traditional diet has on health. **Method:** Surveys. **Target population:** Individuals from 9 aimags (Uvs, Govi-Altai, Khentii, Sukhbaatar, Ovorkhangai, Khovsgol, Darkhan-Uul, Dundgovi, Omnogovi). **Sample:** 414 individuals **Findings:** Consumption of traditional foods

including saturated fat from animal origin has impact on obesity, hypertension and other CVD.

47. Avirmed, D., G. Lhkhagvajargal, et al. (2005). Prevalence of cervical cancer and HPV infection in Mongolia, Mongolian Medical Research Institute; Health Sciences University of Mongolia; Mongolian National Cancer Center. Abstract.

Purpose: To determine the prevalence of cervical cancer and HPV in Mongolia. **Method:** Cancer morbidity determined using statistics from the National Cancer Centre of Mongolia for the last 5 years. HPV infection prevalence was determined using PCR. **Target population:** Women in Mongolia **Sample:** 367 samples from women without previous treatment history for cervical lesions. **Findings:** In the Eastern region, cervical cancer morbidity is 13.8 per 100000. In the central region, it is 12.8 per 100000 which is up to 2 times greater than the national average. Cervical cancer morbidity is highest in Selenge, Bulgan, Darkhan, Hobsgol and HPV prevalence in these regions is up to 37%.

48. Badamgarav, D. and A. Oyunchimeg (2005). Diagnosis, treatment and prevention of pediatric bacterial meriingitis. Ulaanbaatar, Mongolia, Maternal and Child Health Research Center: Abstract.

Purpose: To determine the causes of bacterial meningitis and factors impacting the causes. **Method:** case-control study - samples of spinal fluid taken. **Target population:** Children aged 1 month to 16 years hospitalized in the ICU and Neuropathology department and the respiratory and diarrhea departments. **Sample:** 156 cases from ICU and neuropathology, 123 from respiratory, diarrhea and neuropathology and 150 controls. **Findings:** The main causes of meningitis were haemophilus influenza b and streptococcus pneumonia. Respiratory infections, and other disorders (i.e. Malnutrition, anemia) are among factors that impact meningitis.

49. Dulamsuren, S., L. Narantuya, et al. (2005). Health Service Performance to Rural Population. Ulaanbaatar, Mongolia, Public Health Institute; National Center for Health Development: Abstract.

Purpose: To develop the scientific background for recommendations on how to change the health care structure and management in rural areas. To determine health needs, client satisfaction, quality and access to health services among rural populations. **Findings:** There is a lack of diagnostic and treatment services at the soum hospitals due to a lack of lab tests and essential drugs. Knowledge of volunteers for public health is insufficient. The existing IEC activities do not meet the current needs for health education of the population. Midwives require a reward system to further their skills.

50. Enkhtsetseg, S., G. Enkhjargal, et al. (2005). Report on water-borne disease research. Ulaanbaatar, Mongolia, Ministry Of Health; Public Health Institute; World Health Organization.

Purpose: To develop recommendations for the prevention of water-borne diseases; to determine the water-borne disease prevalence rate using an epidemiological survey for the population

51. Erdenetungalag, R., G. Baigal, et al. (2005). Clinical aspects of vaginal discharges in prepubertal girls visiting the reproductive health counselling center of maternal and child health research in Ulaanbaatar, Mongolia. Ulaanbaatar, Mongolia, Maternal and Child Health Research Center: Abstract.

Purpose: To determine the etiology of a complaint of vaginal discharge in prepubertal girls. **Method:** Cross sectional study. **Target population:** Prepubescent girls who have a complaint or clinical evidence of vaginal discharge in Ulaanbaatar, Mongolia and surrounding areas. **Sample:** 346 prepubertal girls **Findings:** Vaginal discharge in prepubertal girls is caused by poor hygiene. More than half of the sample had pinworm infection. This is a potentially serious social and health problem in prepubertal girls in Mongolia.

52. Erdenetungalag, R. and M. Bayalag (2005). Study of Fetal Alcohol Syndrome Among Newborns in Ulaanbaatar. Ulaanbaatar, Mongolia, Maternal and Child Health Research Center: Abstract.

Purpose: To determine the incidence and prevalence of fetal alcohol syndrome among newborns and mentally retarded children and to describe the characteristics of the women who have children with fetal alcohol syndrome. **Method:** Survey to determine the incidence comparing mothers with children with fetal alcohol syndrome and those without. **Target population:** Mothers of newborns at State Research Center on Maternal and Child Health (those with children with fetal alcohol syndrome and those with children that do not have fetal alcohol syndrome) **Sample:** 43 mothers with children with fetal alcohol syndrome and 86 mothers with children that do not have fetal alcohol syndrome. **Findings:** Mothers having children with fetal alcohol syndrome were younger, less educated, had unwanted pregnancies, had later antenatal care and had previous abortions. The incidence of fetal alcohol syndrome was higher in UB compared to other countries.

53. Kuramitsu, M., C. Kuroiwa, et al. (2005). "Non-polio enterovirus isolation among families in Ulaanbaatar and Tov province, Mongolia: prevalence, intrafamilial spread and risk factors for infection." Epidemiology & Infections 133: 1131-1142.

Purpose: To determine non-polio enterovirus prevalence in urban areas of Mongolia, to assess the degree of interfamilial spread as a measure of its transmissibility and to investigate risk factors for infection. **Method:** Stool

specimens were collected weekly for 5 weeks; swabs were taken from 46 subjects who are caretakers of children. Interviews were conducted. **Target population:** Infants scheduled for OPV immunization and their families in each of the 6 study areas (Chingeltei, Bayangol, Bayanzurkh, Songinokhairkhan districts of UB and Zuum mod, Bayanchandmani from Tov province). **Sample:** 4-5 infants from each of the 6 areas plus their mom, dad and youngest sibling and sometimes another contact (i.e. uncle) for a total of 122 people tested (29 households). **Findings:** 50% of study children excreted poliovirus and the virus was isolated from 4 familial contacts (one sibling, 2 mothers and one uncle). No enterovirus was detected by the hand swabs. Interfamilial spread was responsible for 54% of non-polio enterovirus infections. For people living in houses, inside toilets showed significantly higher degree of interfamilial spread compared to those with outside toilets.

54. Munkhdelger, C., C. Amarjargal, et al. (2005). The Report of Intensified Surveillance on Counterfeit Medicines in Mongolia. Ulaanbaatar, Mongolia, Ministry of Health: 11 pages.

Purpose: To collect samples for the purpose of surveillance, to analyze the samples and to conduct a national workshop on combating counterfeit medicines. **Method:** Drugs were purchased from suspected high risk areas and analyzed visually and in the lab. **Target population:** 225 samples purchased by study team. **Sample:** 55 suspicious drugs were analyzed. **Findings:** 16 of the 55 tested samples were found to be inconsistent with the standard results for that drug.

55. Narantuya, L., Jargalsaikhan, et al. (2005). Health Situation of Rural Population. Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine the health status of rural Mongolians. **Method:** Analysis of hospital records; surveys. **Target population:** Rural Mongolians. **Findings:** Between 1994 and 2003, out-patient morbidity was highest from respiratory diseases, followed by digestive system diseases, urinary tract diseases, circulatory diseases and complications from pregnancy.

56. Nyamdavaa, N., B. Enkhjargal, et al. (2005). Study of the factors associated with the delay in the diagnosis of esophageal and stomach cancers. Ulaanbaatar, Mongolia, Mongolian Medical Research Institute: Abstract.

Purpose: To determine why there is a delay in diagnosis for esophageal and stomach cancers. **Target population:** Patients with esophageal/stomach cancer at the National Cancer Center. **Sample:** 143 patients with stage IV esophageal and/or cardiac cancer receiving outpatient care at the National Cancer Center. **Findings:** The average time delay between appearance of symptoms and admission to the National Cancer Center was 4.5 months. The

reasons for delay were: atypical disease, patient delay in seeking treatment, and misdiagnosis.

57. Nyamdavaa, N. and S. Tuvshingerel (2005). Epidemiological issues in breast cancer in Mongolian women. Ulaanbaatar, Mongolia, Mongolian Medical Research Institute: Abstract.

Purpose: To understand the epidemiology of breast cancer in Mongolian women **Method:** Analysis of breast cancer cases. **Target population:** Mongolian women. **Findings:** Breast cancer accounts for 2.2% of all cancers, and 4.7% of female cancers in Mongolia. The highest incidence rates are in Darkhan-Uul, Dornod, Selenge and UB; the lowest are in Arkhangai, Bayankhongor, Umnigovi and Uvs.

58. Roberts, A., C. Oyun, et al. (2005). "Exploring the social and cultural context of sexual health for young people in Mongolia: implications for health promotion." Social Science and Medicine 60: 1487-1498.

Purpose: To provide a generalized description of the social and cultural factors affecting the sexual health of Mongolian youth. **Method:** Using qualitative methods to explore and describe the social and cultural context in which sexual behaviour is negotiated among secondary students in Ulaanbaatar. 6 focus groups were conducted with students, teachers and health professionals. Males and females were separated. **Target population:** Students in UB. **Sample:** Health Professionals from the National Center for Health Development - selected by purposeful sampling, 32 participants in total (16 students, 8 health professionals and 8 school employees including teachers, administrator and school doctor). **Findings:** 7 main themes that describe the social and cultural context of sexual health in Mongolia: embarrassment, lack of knowledge, concepts of sex, perceptions of condoms, gender roles, peer norms, and the role of drinking in sexual activity. Embarrassment is a barrier for youths, parents, teachers, and institutions and may be due to a lack of knowledge. Sexual activity is most likely to occur when under the influence of alcohol which is heightened by Mongolia's cultural acceptance of heavy drinking.

59. Saijaa, N., P. Enkhtuya, et al. (2005). An assessment of ecological safety during the food preparation. Ulaanbaatar, Mongolia, Public Health Institute: Abstract

Purpose: To assess the ecological safety and contamination of some traditional foods. **Method:** Food and water samples were taken and analysed for heavy metals. **Target population:** samples were taken from 8 aimags, 20 soums, 6 districts of UB. **Findings:** The levels of aflatoxin, heavy metals and pesticides in traditional foods did not exceed the maximum acceptable level.

60. Sevd, T., K. Mmari, et al. (2005). "Acceptability as a key determinant of client satisfaction: lessons from an evaluation of adolescent friendly health services in Mongolia." Journal of Adolescent Health 38: 519-526.

Purpose: To investigate which characteristics of health service quality are most likely to determine client satisfaction with health services among adolescents in Mongolia. **Method:** Interviews/questionnaires to measure client satisfaction. **Target population:** Adolescents visiting health facilities **Sample:** 1301 male and female clients (124 questionnaires excluded from data analysis). **Findings:** The strongest determinant to client satisfaction was adequate physical environment (i.e. clean environment), adequate information about the facility, and whether the facility is private. Clients who had some interruptions to their service were less likely to be satisfied. Few clients are able to assess whether health care providers have sufficient knowledge.

61. Sumberzul, N., W. Govind, et al. (2005). Survey report on "National programme assessment on elderly health and social welfare" Ulaanbaatar, Mongolia, School of Public Health, Health Sciences University of Mongolia; Ministry of Health.

Purpose: To develop further strategies related to elderly health and social protection in Mongolia by assessing the implementation of Mongolia's elderly health and social welfare national program. **Method:** Program evaluation.

62. Tsatsralt-Od, B., M. Takahashi, et al. (2005). "High Prevalence of Dual or Triple Infection of Hepatitis B, C, and Delta Viruses Among Patients with Chronic Liver Disease in Mongolia." Journal of Medical Virology 77: 491-499.

Purpose: To investigate the prevalence of HBV, HCV and HDV infections and the presence of dual or triple infections. **Method:** Serum samples were collected and tested. **Target population:** Chronic liver patients in Ulaanbaatar. **Sample:** 207 samples from patients with chronic liver disease receiving care at 4 city hospitals in UB. **Findings:** 83.3% of patients had infections with one or more of these 3 hepatitis viruses. 27% had both HBV/HDV and 8% ha HBV/HCV, and 30% had triple viremia.

63. Tsatsralt-Od, B., M. Takahashi, et al. (2005). "High Prevalence of Hepatitis B, C, and Delta Virus infections among blood donors in Mongolia." Archives of Virology 150: 2513-2528.

Purpose: To investigate the prevalence of Hepatitis B Virus (HBV), Hepatitis C virus (HCV) and Hepatitis D virus (HDV) infections among first time and repeat blood donors in Mongolia by serological and molecular approaches in an attempt to estimate the prevalence of these viruses in the general population and to improve the safety of the blood supply in Mongolia. **Method:** Serum samples were collected and tested **Target population:** Blood donors **Sample:** 403 serum samples **Findings:** HBV and HCV infections are highly prevalent

among blood donors and HDV infections are highly prevalent among HBV infected blood donors. The highest prevalence was among donors between the ages of 18 and 49. In donors between 50 and 66, HBV DNA was not detectable, however anti-HCV was detected in 67%. HDV occurs much more frequently among HBsAg or HBV DNA positive donors in Mongolia (75.8%) than in other countries (up to 25%). Blood safety is still of great concern in Mongolia as HBV, HCV, HDV are highly prevalent among first time donors.

64. Tsegmed, S., P. Enkhtyua, et al. (2005). Tobacco consumption (Mongolia STEPS NCD risk factor survey). Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine the prevalence of tobacco use among different segments of the Mongolian population aged 15-64 years. **Method:** Nationwide cross-sectional survey using WHO Stepwise survey methodology. **Target population:** Mongolian population (both urban and rural) aged 15-64 years. **Sample:** Multi-stage cluster sample; 3411 people (1674 males, 1737 females). **Findings:** The proportion of current daily smokers was 43.1% in males and 4.1% in females in the surveyed population. There was a marked gender difference noted in the prevalence of daily smokers (males 8 times higher compared to females). The average age of initiation of smoking was 20 years. The average years of smoking among the surveyed population was 17.5. Most of the smokers used manufactured cigarettes.

65. Tserendash, B., L. L. Tulgaa, et al. (2005). Prevention of fatty degeneration of liver on the basis of study of risk factors such as alcohol consumption, over weight and nutritional and drug factors. Ulaanbaatar, Mongolia, Mongolian Medical Research Institute: Abstract.

Purpose: To determine risk factors for fatty degeneration of liver. **Method:** Survey; Analysis of nutritional data. **Target population:** Patients with fatty degeneration of the liver. **Findings:** Patients with fatty degeneration of liver (FDL) consumed 5 times fewer fruits and vegetables than flour/fats - they consume 92% more fat, 23% more protein and 32% more calories than healthy individuals. 43% of patients with FDL were overweight and drank more alcohol. Recommendations: Developed nutritional formulation most suited for patients with FDL and recommended management for FDL.

66. Tserendogor, U., D. Ganmaa, et al. (2005). Effects of vitamin D fortified milk on vitamin D status in Mongolian school age children. Ulaanbaatar, Mongolia, Public Health Institute; Departments of Nutrition and Epidemiology, Harvard School of Public Health; Department of Ambulatory Care and Prevention, Harvard School of Medicine; Dana Farber Cancer Institute: Abstract.

Purpose: To determine the prevalence of vitamin deficiency in school children in Mongolia and to evaluate the effect of vitamin D fortified western milk

on their vitamin D status. **Method:** Pilot intervention study single group, pre-test, post-test design. Intervention: One month of drinking 710 ml of vitamin D fortified milk daily. **Target population:** Mongolian school aged children aged 10-11 years. **Sample:** 46 Mongolian children (22 girls and 24 boys) aged 10-11 years. **Findings:** Pre-test: 8.7% of sample were vitamin D deficient and 91.3% had low a level of vitamin D concentration in the blood. Post-test: Percentage of school children with low level of vitamin D concentration decreased from 93% to 37% and the percentage of vitamin D deficient children decreased from 16% to 0%. States that the results confirm that drinking of vitamin D fortified milk remarkably appears to improve vitamin D status of Mongolian school age children.

67. Tserendolgor, E., T. Enkhjargal, et al. (2005). Nutritional and micronutrient deficiency and anemia of birth-aged women and some risk factors: Abstract.

Purpose: To determine the prevalence of anaemia and micronutrient deficiency among women of reproductive age. **Target population:** Mongolian women of reproductive age. **Findings:** 24.7% of pregnant women were anemic (moderate rating according to WHO criteria); 37.1% of pregnant women and 30.5% of new mothers have vitamin D deficiency.

68. Tugsdelger, S. (2005). Assessment of HIV/STI situation in selected border areas in Mongolia. Ulaanbaatar, Mongolia, Ministry of Health; National AIDS Foundation: 15 pages.

Purpose: To obtain baseline data on the HIV/STI situation in border areas that will contribute in advocacy and planning strategies. **Objectives:** To assess HIV/AIDS-related knowledge and behaviours of the general population in border areas and mobile populations; to identify specific risk behaviours in need of change; to assess the magnitude of and risks associated with commercial sex work in border areas; to elucidate opinions of local decision-makers and health professionals regarding the HIV/STI situation in the area and plausible prevention strategies. **Method:** Interviews with local decision-makers and health professionals; focus group discussions with female sex workers; behavioural survey of local residents and mobile population. **Target population:** Decision makers and health professionals in border areas, female sex workers, mobile population, local residents (of border areas). **Sample:** Study conducted in 3 border area ports (Altanbulag on border with Russia, Khavirga and Gashunun Sukhait ports on border with China). All local decision-makers and health professionals interviewed; 1 focus group discussion per port with 10-12 sex workers; 283 mobile traders; 577 local residents. **Findings:** Border area aimags have become increasingly vulnerable to HIV because of the high rates of unemployment, poverty, increasing sex work and population mobility. Yet, there is little evidence of the commitment to HIV/STI control at the local level. In addition, the assessment has identified high levels of risky sexual behaviour in both border area and mobile populations, which is likely to sustain HIV/STI transmission.

69. Tugsdelger, S., T. Amgalan, et al. (2005). Second Generation HIV Surveillance: Mongolia, 2005. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Global Fund; National Center for Communicable Diseases: 30 pages.

Purpose: Overall goal is to obtain data that will show trends of HIV epidemic and its determinants and contribute in advocacy and planning strategies for prevention and control of HIV. **Objectives:** to monitor HIV trends in subpopulations at particular risk of HIV/STIs and the general population; to identify syphilis prevalence and trends in asymptomatic pregnant women and selected population groups; to assess HIV/AIDS-related knowledge and behaviours in these groups; to provide information on the effectiveness of HIV prevention and control programmes. **Method:** Second generation HIV surveillance (STI prevalence survey based on routine HIV/syphilis screening, HIV and behavioural surveillance survey of groups at high risk of HIV infection, behavioural survey of youth). **Sample:** STI prevalence - pregnant women attending ante-natal care (27420), blood donors (15980) and TB patients (3548); HIV and behavioural - groups considered to be high risk (female sex workers - 350, men who have sex with men, mobile men, adult male STI clients; Behavioural - unmarried people aged 15-24 years (2838). **Findings:** High rates of syphilis, low condom use and low HIV knowledge suggest that Mongolia is at high risk of HIV transmission. Despite low HIV prevalence, there is evidence that Mongolia is a country at high risk of HIV transmission with high rates of syphilis and low rates of consistent condom use. Found that men who have sex with men and sex workers had a potential of being a significant conduit of HIV transmission despite their relatively high educational attainment and high levels of exposure of HIV/AIDS/STI prevention interventions. Despite knowledge that condoms can reduce the risk of HIV transmission, condom use remained low among all population groups surveyed. General awareness of HIV/AIDS was very high, however comprehensive knowledge about HIV prevention and transmission was low. Findings suggest that IDU is not currently a major route of HIV transmission.

70. Viinanen, A., S. Munhbayarlah, et al. (2005). "The protective effect of rural living against atopy in Mongolia." Allergy 60(11): 1357-1360.

Purpose: To investigate the effects of rural living and migration from rural to urban areas on the risk of atopy. **Method:** Cross-sectional study (interview with a questionnaire; clinical exam). **Target population:** Mongolians aged 10 - 60. Sampling frame: screening data obtained 9453 subjects aged 10 - 60 years from Ulaanbaatar city, 3 rural towns and 7 villages. **Sample:** 869 subjects were examined and completed the study. **Findings:** The risk of allergic rhinoconjunctivitis and allergic sensitization were the lowest in subjects living in a village from birth and intermediate in subject who had relocated from a village to a town compared with subjects living in a town from birth. Simultaneous exposure to herd animals and dung heating decreased the risk of atopy. Keeping

animals was a risk-factor for asthma only in Ulaanbaatar city. Continuing farm exposure after childhood may be important in reducing the risk of atopy.

71. Viinanen, A., S. Munhbayerlah, et al. (2005). "Prevalence of asthma, allergic rhinoconjunctivitis and allergic sensitization in Mongolia." Allergy 60: 1370-1377.

Purpose: To investigate the prevalence of asthma, allergic rhinoconjunctivitis and allergic sensitization in 3 different environments in Mongolia. **Method:** Interviews, 2 phase data collection; clinical evaluation, skin prick test. **Target population:** Family members (mother, father, daughter and son, age range 10-60) in the study areas. **Sample:** 9453 subjects randomly selected (3283 families). **Findings:** Age and sex adjusted asthma prevalence was highest in rural towns (2.4%) but was most severe in UB than in rural towns or villages. The prevalence of allergic rhinoconjunctivitis and allergic sensitization increased with increasing urbanization. Recommendations: The increasing burden of asthma and allergies in Mongolia calls for a management plan of these diseases similar to sub-Saharan Africa.

72. Bazarragchaa, T., T. Erkhenbaatar, et al. (2005-2006). Some peculiarities of pregnancy and delivery in different regions of Mongolia. Ulaanbaatar, Mongolia, Public Health Institute; Maternal Health Center: Abstract.

Purpose: To provide informative, scientifically packaged health information, which reflects peculiarities of pregnancy and deliveries of each region for the regions to use in health policy (esp. in maternal mortality reduction policy) and regional development policy. **Method:** Analysis of health and population statistical reports from all aimags and UB related to pregnancy and delivery in the past 5 years. Calculation of median and percentages. **Target population:** Pregnant women. All reported pregnant women and those reported to have delivered from all aimags and UB in past 5 years (~2000-2005). **Findings:** Average of 74405 women got pregnant each year. Miscarriages and abortions per 1000 live births were higher in Eastern region compared to other regions and UB. Adolescent pregnancy was 2.7 times lower in Western region and deliveries after age 35 with one year birth placement was higher in Western region. Almost half of reported complications were due to hemorrhage. Pregnancy complications were higher in women living in UB, Khangai and Eastern regions. Women in Western region were more vulnerable than other regions. MM per 100 000 live births was highest in Western region and lowest in Eastern region (in past 4 years). Main reasons for MM were pre-eclampsia and eclampsia during pregnancy, and hemorrhage during delivery. **Conclusion:** Region-specific activities are needed to reduce MM in Mongolia.

73. (2006). KAP Survey among prisoners on RH/STIs/HIV/AIDS. Ulaanbaatar, Mongolia, Mongol Vision PHO.

Method: KAP survey; **Findings:** Cannot reveal the results of the survey because of their contract with the General Authority of Court Decision Agency.

74. (2006). Research report on "Impact of legal regulations in environment fighting against HIV and AIDS" Ulaanbaatar, Mongolia, World Health Organization; Global Fund: 15 pages.

Purpose: To compare the legal regulations of Mongolia to those of the Russian Federation, Ukraine, Thailand and Sweden; To observe the behaviours and organization of social groups that are at high risk for spreading HIV. **Method:** Surveys conducted among social groups with high probability of infecting others with HIV/AIDS, STIs and these groups were observed. Comparative research was conducted on national and international HIV/AIDS legal regulations. **Sample:** 234 prostitutes, 60 police officials working against prostitution, 5 government officials working on monitoring of entertainment places, saunas and massage houses, 20 government officials working with people infected with AIDS, HIV and STI, 10 private doctors and 400 citizens. Focus interviews were conducted with 22 prostitutes and 70 citizens, some of which were video recorded. **Findings:** The main challenge for the police is to fight with human trafficking and prostitution instead of charging the prostitutes. Over 60% of the prostitutes participating said that the reason for prostitution was unemployment, 10% said that they use condoms to prevent STIs. Most of the prostitutes were included in police registration but there is a lack of knowledge of the prostitutes about ways to protect themselves. "Spying" research was conducted in 25 massage parlours and 80% indicated that other services than those available on the menu are available.

75. Altanchimeg, D., B. Solongo, et al. (2006). Research report : "UerkhelLOVE" newspaper. Ulaanbaatar, Mongolia, Mongol Vision PHO; UNFPA: 9 pages.

Purpose: To determine the opinions of the readers of the UerkhelLove newspaper (produced with the financial support of the UNDP) on its content, quality of information, distribution and design; to make recommendations on the future development of UerkhelLove. **Method:** Individual questionnaire interviews; focus groups. **Target population:** Mongolian adolescents aged 10-18. **Sample:** 706 adolescent students aged 10-18 years.

76. Baasanjav, D., R. Sarantsetseg, et al. (2006). Growth of elderly population in Mongolia during last 17 years (1989-2005). Ulaanbaatar, Mongolia, Mongolian Medical Research Institute: Abstract.

Purpose: To study the number of elderly population (60y+ and 65y+) in Mongolia in the period from 1989 - 2005 (the last 17 years). **Method:** Analysis of Mongolian population census data developed by the National Statistics Office of Mongolia. **Target population:** Mongolian population (census data used). **Findings:** According to an international classification, Mongolia belongs to the

category of countries with young populations (1990 = 4.1% 65y+, 2000-2005 = 3.5% 65y+). Very little increase in number of elderly people (stagnant). Increase in average percent of elderly is 10x less than the international average.

77. Baasanjav, M., T. Sovd, et al. (2006). Assessment of the Conformity of National Policies with the Framework Convention on Tobacco Control in Mongolia. Ulaanbaatar, Mongolia, International Development Research Centre (Canada); Mongolian Public Health Professionals Association: 27 pages.

Purpose: To assess the conformity of Mongolia's national tobacco control legislation with the WHO Framework Convention on Tobacco Control. **Method:** Review of relevant national policy documents; monitoring of the print media and broadcast media for the status of banning tobacco advertising, promotion and sponsorship; interviews with randomly selected MPs. **Findings:** Found that the tobacco control policy documents do not address all aspects of a comprehensive tobacco control policy required to optimally reduce tobacco use in the country. Despite the ban of tobacco advertisement by 3 laws, the tobacco industry freely advertises its products via all communication channels. The weaknesses in conformity stem largely from the lack of political commitment to tobacco control. In addition, the tobacco industry apparently has connections with political forces and has strong economic influence on the media.

78. Baigali, O., B. Burmaa, et al. (2006). Research on lead pollution in some workplaces in UB City. Ulaanbaatar, Mongolia, Public Health Institute; Ministry of Health; World Health Organization; Institute of Ecology and Occupational Safety, Angarsk, Russia: 18 pages.

Purpose: To determine sources of environmental lead pollution and level of lead in some workplaces with exposure to lead (auto repair) located in UB. To make recommendations on prevention of lead pollution and develop a draft plan of action. **Method:** Analysis of air lead content, paint lead content, lead content in emissions from different types of cars. **Sample:** 19 workplaces in 6 districts in UB city were selected and air samples were taken. A total of 74 samples were analyzed. **Findings:** Found that the level of lead in workplace air of some auto repair shops, as well as the level of lead in selected paints do not exceed the standard level. Results showed that the lead content in studied workplaces as 1.8 times lower than the accepted standard level. Results also showed that the lead content in the air of studied workplaces is lower than OSHA's (USA Occupational standards), NIOSH's, Russia's and Mongolian national standards.

79. Baigalmaa, D., A. Nishimura, et al. (2006). "Smoking cessation rate 12 months after a group counselling program in Mongolia." Asian Pacific Journal of Cancer Prevention 7(3): 399-402.

Purpose: to assess the effectiveness of a free group counselling program by trained medical doctors and health educators based on "5A" (ask, assess,

advise, assist, and arrange) with 12 months follow-up in 2002-2003. **Method:** program (intervention) outcome evaluation. **Target population:** Mongolian adults with the intention to quit smoking who took part in the free group counselling smoking cessation program. **Sample:** 517 smokers with the intention to quit smoking in 3 big Mongolian cities (Ulaanbaatar, Darkhan, Erdenet). **Findings:** Found that 65% of program participants were not smokers 12 months after the program. The cessation rate was significantly higher in 2003 than in 2002 indicating that the effectiveness of the program had improved over time. Group counselling based on the "5A" approach by medical doctors and health educators seems effective for smokers with an intention to quit smoking. Recommendations: The present approach may be more appropriate in Mongolian conditions than nicotine replacement therapy.

80. Bayarmaa, D., B. Norjmaa, et al. (2006). Fluoride in drinking water and comparative study of fluorosis among young children in different regions. Ulaanbaatar, Mongolia, Mongolian Railway Transport Inspection Department; Central Railway Hospitals; School of Dentistry, Mongolia: Abstract.

Purpose: To determine the effect of the fluorine level in water on the prevalence of dental disorders in young children in different geographic regions of Mongolia. **Method:** Measurement of fluorine levels in drinking water used in railway stations. Medical examination of children. Five years of monitoring data analyzed. **Target population:** Young children in Mongolia. **Sample:** 12 villages in the Khangai Steppe and Gobi regions. 1012 children aged 3-7 years underwent medical examinations for caries and fluorosis (dental disorders). **Findings:** Fluoride content in drinking water in the Railway areas of the Gobi region is higher than the hygienic standard level. The high level of fluoride is related to the high prevalence of fluorosis found in young children in the Gobi region.

81. Bolormaa, N., B. Tsogzolmaa, et al. (2006). The prevalence of overweight and obesity in the Mongolian population (Mongolia NCD STEPS survey). Ulaanbaatar, Mongolia, Public Health Institute; Ministry of Health; World Health Organization.

Purpose: To determine the prevalence of overweight and obesity as intermediate NCD risk factors and to establish the baseline information for NCDs prevention and control; to conduct a comparative study on the prevalence of overweight and obesity stratified by age, gender and locality; to establish the baseline nationally representative information on these risk factors. **Method:** Nationwide cross-sectional survey using WHO Stepwise survey methodology. **Target population:** Mongolian population aged 15-64 years. **Sample:** Survey data collected from 3445 individuals and 3411 valid participants aged 15-64 years. **Findings:** Of surveyed population: 4.9% underweight, 63.5% normal, 31.6% overweight (21.8%) and obese (9.8%). Higher prevalence of overweight

and obese in women than in men. No difference in mean BMI of males and females in both urban and rural areas. Prevalence of overweight/obesity in urban males was higher compared to rural males whereas in females of rural areas, the proportion of obesity was higher than in urban areas. Waist-hip ratio (WHR): mean by sex tended to increase with age. Mean WHR lies outside normal range for women aged 35 and above. The proportion of women with central obesity was 2 times higher in the female population as compared to the male population.

82. Cartagena, R. G., P. J. Veugelers, et al. (2006). "Effectiveness of an HIV Prevention Program for Secondary School Students in Mongolia." Journal of Adolescent Health 39(6): 925.e9-16.

Purpose: To evaluate the effectiveness of a 3-year HIV prevention program for adolescents attending secondary school in Mongolia. **Method:** Comparisons of knowledge, attitudes, self-efficacy and safe sex practices of grade 10 students from schools with a peer education prevention program to grade 10 students from schools without the intervention. **Target population:** Adolescents attending secondary school in Mongolia. **Sample:** 720 randomly selected students (grade 10, aged 15 - 19) from 8 schools with the peer education program and 647 students (same age group and age) from 8 schools without this intervention (the peer education program was launched in 2000 across Mongolia). **Findings:** Students of schools with the program were statistically significantly more knowledgeable, had less traditional attitudes, and had greater awareness of their self-efficacy in regards to HIV and sexual health. Safe sex practice was found to be statistically significantly safer in a subset of schools that had small teams of peer educators. Recommendations: Adolescents in Mongolia are sexually active and at risk for infection with HIV and other STIs. Peer education programs, particularly those that are managed by small teams, appear effective and should be implemented more broadly.

83. Chimedsurn, O., N. Khuderchuluun, et al. (2006). Regional variation in life expectancy, birth and life tables of Mongolia. Ulaanbaatar, Mongolia, School of Public Health, Health Sciences University of Mongolia; Department of Health Statistics, National Center for Health Development; Cancer Research UK Cancer Survival Group; Non-communicable Disease Epidemiology Unit, Department of Epidemiology and Population, London School of Hygiene and Tropical Medicine: Abstract.

Purpose: To estimate mortality trends for Mongolia and create national regional life tables. The findings are meant to enable the estimation of relative cancer survival. **Method:** Information on population estimates and number of deaths, stratified by age, sex and provinces for 1999-2005 was obtained from the National Statistical Office of Mongolia. Ewbank, and Elandt-Johnson and Gompertz 1980 methods used. Study population: Complete life table created for each sex and for 4 Mongolian regions (Khangai, Western, Eastern, Central), the capital city of Ulaanbaatar, and for capital and non-capital areas. **Findings:** Large differences were observed in life expectancies between male and female.

The life expectancy at birth was consistently higher for females, with the lowest estimates in the Western, Eastern and Central regions. The constructed regional-specific life tables in this study may help to support a regional oriented economic and health policy that may reflect in a reduction of the existing gap in poverty and life expectancy at birth between Mongolian regions.

84. Chuluundorj, O. (2006). A Multi-level study of vulnerability of Mongolian Pastoralists to natural hazards and its consequences on individual and household well-being. Denver, University of Colorado at Denver. PhD: 260 pages.

Purpose: To understand how environmental challenges interact with political and socioeconomic circumstances and the adaptive strategies employed by herders to effect the well-being of rural pastoral households. **Method:** a combination of geographic, social, economic and anthropological methodologies - a spatial ecological study at the county/community level, and a cross-sectional study of households sampled from four counties in Mongolia including structured interviews as well as anthropometric measurements. **Target population:** Rural counties and households **Sample:** 250 rural counties in Mongolia are included in the spatial analysis of climatic, socioeconomic, and health conditions and 120 households sampled from four counties in Mongolia for the cross sectional analysis. **Findings:** Climate stress is not the main factor that determines the outcome of disasters, however socioeconomic and sociodemographic characteristics indicate sensitivity to disasters. The study found that better adaptive strategies (livestock per person and livestock density) also were related to better health outcomes with one exception: a larger number of livestock per person was predictive of higher maternal mortality which is contrary to what has been proposed. Large household size and a large proportion of members in the workforce were associated with increased wealth of households and perception of living in a safer area was also associated with wealth. Greater levels of social cohesion and sharing also contributed to greater wealth. Higher levels of education were associated with a decreased risk of anemia and nutritional deficiency.

85. Dambadarjaa, D., T. Ojima, et al. (2006). "Hepatitis delta virus infection in Mongolia: analyses of geographic distribution, risk factors, and disease severity." American Journal of Tropical Medicine and Hygiene 75(2): 365-369.

Purpose: To assess the prevalence and risk factors for hepatitis delta virus (HDV) infection among Mongolian school children. **Method:** Cross-sectional study (detection of antibody against HDV and HDV RNA; structured interviews). **Target population:** Mongolian school children **Sample:** 181 children with past or ongoing hepatitis B virus infection who were investigated during the nationwide serosurvey conducted in 2004. **Findings:** The prevalence of antibody to HDV was 6.1%, with the proportion of 13.6% among hepatitis B surface antigen-positive subjects, all of whom had HDV RNA. Injections and blood sampling in

health care settings, hospitalization and cohabitating with patients with chronic hepatitis predicted the seropositivity for antibody to HDV. Results suggest that parental exposures in health care settings and household transmission are the main routes of HDV transmission among Mongolian children.

86. Davaa, G. and N. Huderchuluun (2006). Study of the dynamics and trends in acute viral hepatitis in Mongolia. Ulaanbaatar, Mongolia, Department of Epidemiology and Biostatistics, School of Public Health, Health Science University of Mongolia: Abstract.

Purpose: To analyze the general trends, dynamics and seasonal variations of acute viral hepatitis in Mongolia and to determine future trends. **Method:** Analysis of annual and long term trends in viral hepatitis using cases registered between 1952 and 2005 using regression analysis. Used data to determine future trends. **Target population:** Mongolia. **Sample:** All registered cases of viral hepatitis between 1952 and 2005. **Findings:** Rates of all types (overall) of viral hepatitis has decreased b/w 1952 and 2005. Rates of viral hepatitis B have been slightly decreasing since 1992. Registered cases of gastro-intestinal disease hepatitis A have been steadily high between 1981 and 2005. Found great seasonal variations in rates of hepatitis A.

87. Davaasuren, D., N. Radnaakhand, et al. (2006). Survey report on evaluating the quality of care delivered to sick children attending primary healthcare facilities of Ulaanbaatar city. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Health Sciences University of Mongolia: 38 pages.

Purpose: To define level of health care quality delivered to children at primary health facilities in UB city. To specifically explore assessment, classification, treatment, counselling of caretakers, supply and availability of essential drugs and equipment in health facilities as well as challenges faced. **Method:** Cross-sectional study. Survey based on methodology of the WHO Integrated Management of Childhood Illness (IMCI) Health Facility Survey tool to evaluate the quality of care delivered to sick children attending outpatient facilities. **Target population:** Mongolian children aged 2 months to 5 years and health workers who manage sick children in Mongolia. **Sample:** 167 sick children from aged 2 months up to 5 years visiting a selected health facility for an initial sick visit, 101 physicians (not only IMCI-trained docs) and 41 Family Group Practices (FGPs) were selected as samples of the survey. Cluster survey with children taken to a health facility on the day of the survey forming a cluster. Clusters were randomly selected from a list of 294 health facilities covered by the IMCI strategy. **Findings:** Found low levels of assessment of rickets (34.2%) and weighting of the children against the growth chart (39.2%). There are quite a number of cases in which antibiotics were prescribed during an inappropriate period of the child's condition and incorrect counselling was given to parents on usage of antibiotics. FGPs are sufficiently provided with the essential equipment (91.5%) and 6 kinds of vaccines (92.6%) for the provision of full immunization

services to children. The supply of essential drugs is quite good (81.3%), however vitamin D supplies are insufficient.

88. Dulamsuren, S., N. Narangerel, et al. (2006). Current situation of postgraduate training and professional needs. Ulaanbaatar, Mongolia, Health Management Department, National Centre for Health Development: Abstract.

Purpose: to determine the current situation of postgraduate health training needs in Mongolia.

89. Dvaalkham, D., T. Ojima, et al. (2006). "Prevalence and risk factors for hepatitis C virus infection in Mongolian children: findings from a nationwide survey." Journal of Medical Virology 78: 466-472.

Purpose: To investigate the prevalence of HCV antibodies and probable routes of transmission in elementary school children in 4 geographical areas and the metropolitan areas of Mongolia. **Method:** Survey, subjects divided by geographic location, and then clusters and multi-stage random cluster sampling was used. Blood specimens were collected. **Target population:** School children in Mongolia. **Sample:** 1271 students from 4 classes of the 25 schools chosen at random. **Findings:** 1.5% of students (17) tested positive for anti HCV antibodies and 0.6% were confirmed to have HCV seroprevalence. Anti HCV seropositivity was higher for those from metropolitan areas and lowest in the soums. The prevalence of anti HCV antibodies increased with age and children with histories of dental manipulation and surgery were more like to be anti-HCV seropositive. Recommendations: Strict guidelines on disinfection and sterilization procedures for medical instruments in dentistry and surgery are urgently required and must be followed to control HCV infection.

90. Dvaasruan, D. and G. Soyolgerel (2006). Report on the Reassessment of Injection Practice in Mongolia. Ulaanbaatar, Mongolia, Ministry of Health; Health Sciences University of Mongolia: 22 pages.

Purpose: To assess injection practices at primary healthcare facilities of Mongolia by determining the level of waste management at health facilities, comparing current injection practices to the proposed safe injection practices, identifying safe injection practices and developing recommendations to improve safety of injections. **Method:** The WHO standard data collection sheets were adapted into Mongolian context; Questionnaires were given to physicians and the general population. 138 injections were observed. **Sample:** 101 Participant healthcare organizations in 8 aimags and 2 districts of UB. 135 physicians, 20 bagh feldshers, 160 injection administering nurses, 176 adults between 16 and 68 and 24 children between 5 and 15 were interviewed. **Findings:** Found that almost 85% of physicians prefer prescribing oral medications and 69% of the population surveyed prefer oral medications. 51% of physicians, 37% of nurses and 7% of the general population were aware that HIV/HepC/HepB could all be

transmitted via injections. Disposable syringes are used in 99.3% of injections and 86% are discarded in sharps boxes which is an improvement from the previous survey. The total number of injections has decreased by 39% and there are 8 injections per person per year.

91. Enkhjargal, A. and J. H. Hashim (2006). Health impact assessment of ambient air pollution. Malaysia, Environmental Health Unit, Department of Community Medicine, Faculty of Medicine, National University of Malaysia Hospital: Abstract.

Purpose: To determine the relationships between air pollutants (nitrogen dioxide and sulphur dioxide) and meteorological parameters and respiratory and cardiovascular morbidity and mortality in two cities in Mongolia. **Method:** A cross-sectional study using secondary air quality and hospital morbidity and mortality data. **Target population:** The populations of two cities in Mongolia (including Ulaanbaatar). **Findings:** Relative humidity and cardiovascular case admission were mildly inversely correlated with each other in UB hospitals. NO2 and SO2, relative humidity and air pressure were directly correlated with respiratory case admissions. There is a strong influence of temperature on respiratory morbidity, whereby winter months and cold temperature are associated with increased air pollution and higher respiratory hospital case admissions. The main source of poor air quality is coal combustion in the ger areas, thermal power plants and motor vehicles. **Conclusion:** Mongolia needs to develop a comprehensive policy on the control and reduction of air pollution which currently is lacking.

92. Enkhtungalag, B., J. Batjargal, et al. (2006). Fruit and vegetable intake and risk for NCD of the population (Mongolia NCD STEPS survey) Ulaanbaatar, Mongolia, Public Health Institute; Ministry of Health; World Health Organization.

Purpose: To determine the mean fruit and vegetable intake in different segments of the Mongolian population and the associated risk of NCD. **Method:** Nationwide cross-sectional survey using WHO Stepwise survey methodology. Included questions meant to clarify the number of days per week in which the person consumed fruits and vegetables. **Target population:** Mongolian population aged 15-64 years. **Sample:** Survey data collected from 3445 individuals and 3411 valid participants aged 15-64 years. **Findings:** The average fruit and vegetable intake was reported as being 3.2 serving sizes per day in the surveyed population; thus fruit and vegetable consumption is almost 1.5 times lower than the recommended 5 serving sizes or 400 grams. 72.5% or most of the surveyed population consumed less than 5 servings of fruits and vegetables daily. The mean number of serving sizes of fruits and vegetables was 1.5 times lower than in rural residents as compared to urban residents. The mean number of serving sizes of fruits and vegetables was 2.4 times lower in south area residents as compared to central area residents.

93. Erdenechimeg, E., B. Burmaa, et al. (2006). Results of study of some hygienic indices in secondary and primary schools. Ulaanbaatar, Mongolia, School of Public Health, Health Sciences University of Mongolia; Mongolian Ministry of Health; Public Health Institute: Abstract.

Purpose: To determine whether or not schools in UB meet the hygiene standards for average resource land area per student and class sanitation standards. **Method:** Cross-sectional analysis. **Target population:** High school and primary school students in UB city. **Findings:** The resource areas and class sanitation in UB schools were found to be insufficient and did not meet the hygienic standards. **Conclusion:** Overloading in schools influences the hygienic regimen and microclimate in the class and may lead to an increase in airborne and intestinal infectious disease.

94. Gandolgor, G. and R. Narantsetseg (2006). Possibilities to increase wages for nurses and other health workers. Ulaanbaatar, Mongolia, Regional Diagnostic and Treatment Center, Dornod Aimag: Abstract.

Purpose: To study the possible impact of increasing salaries and incentives of nurses and other health workers. **Method:** Quantitative survey. Study population: 101 nurses between the ages of 20 and 50 of the Regional diagnostic and treatment center, Dornod Aimag. **Findings:** Found that 59.4% of those surveyed were not satisfied because of low salary.

95. Ganzaya, S. and N. Naranbat (2006). The study of geographical and seasonal factors (related to) tuberculosis in Mongolia. Ulaanbaatar, Mongolia, National Center for Communicable Disease: Abstract.

Purpose: To determine the geographical location and seasonal effects on TB incidence in Mongolia. **Method:** Statistical analysis of 2000-2004 reports of TB control organizations working in Mongolia. **Target population:** Population of Mongolia. **Findings:** The central and eastern regions of Mongolia have the highest incidence rates of TB. All new TB cases in 2004: central (27.3%), eastern (11.4%), western (5.8%), Gobi (3.2%). Most new cases were registered in Ulaanbaatar - 49.8%. This study shows that TB morbidity in Mongolia has the tendency to increase. Also, found seasonal and geographical variation of TB incidence in Mongolia.

96. Govind, R., K. Ashbai, et al. (2006). Injuries in Mongolia, 2003-2004 (second survey report). Ulaanbaatar, Mongolia, Public Health Institute; National Traumatology and Orthopedic Teaching Hospital; World Health Organization; Ministry of Health: 72 pages.

Purpose: To explore types of injuries, their causes, incidence for further planning and implementation of injury prevention interventions. This study was done 3 years after the Government of Mongolia approved the National Programme on Injury Prevention and is within the framework of the Programme. To analyze and assess all available statistical data and reports on injury for the

past 2 years (2003-2004) by location in order to determine the current situation and provide recommendations on injury prevention. **Method:** Survey assessment of the statistical data on injuries from 2003-2004. Questionnaire delivered to relevant organizations to fill out. **Target population:** Entire population of Mongolia. **Sample:** Official data, reports, initial documents, population and crime registration, publications on reported injury and poisoning from 8 state organizations. **Findings:** Injury, poisoning and external causal factors were the third leading cause of death (103.9 per 100000 pop.) in 2004. This rate was 35.8 in 1998. The rate in UB is 1.4 times the national average. Road traffic injuries are the first leading cause of death due to injury among both sexes. Followed by: Males - suicide, homicide, alcohol-related injuries and poisoning; Females - homicide, suicide, intentional falls. Males are 4.3 times more likely to die due to injuries than females. Death rate due to injuries is highest in people aged 40-44 (204.6). In UB the morbidity rate due to injuries is 7083.7 per 100 000 - 1.9 times national average.

97. Greene, L. (2006). Goats, Chrome and Sperm: Assessing reproductive effects of occupational exposures in Mongolian leather tanneries. Rollins School of Public Health. Atlanta, Georgia, Emory University: Unpublished - Work in progress.

Purpose: To assess the reproductive effects of occupational exposures in Mongolian leather tanneries. To determine whether workers' exposure to chromium and other compounds is associated with infertility, spontaneous abortion, low birth weight, and other outcomes. **Method:** Reproductive risk assessment questionnaire and face-to-face interviews.

98. Hill, P., R. Dodd, et al. (2006). "Health Sector Reform and Sexual and Reproductive Health Services in Mongolia." Reproductive Health Matters 14(27): 91-100.

Purpose: To provide a broader understanding of the pace and scope of reform within the health sectors in Mongolia and examines how these have impacted the sexual and reproductive health services. **Method:** Documentary analysis and 26 in-depth interviews with Ministry of Health and other key stakeholders in sexual and reproductive health. **Target population:** Key stakeholders in sexual and reproductive health. **Sample:** 26 MOH and Key Stakeholders. **Findings:** The negative impacts of the social transition include increasing adolescent pregnancy and high STI rates. The WHO, UNFPA ad GTZ have maintained sexual and reproductive health as a focus for the MOH; the high profile of the MDGs has strengthened political support of sexual and reproductive health matters. The highly medicalised workforce in the health services is an inappropriate mix with little capacity to address the challenges of safe motherhood for vulnerable groups as well as reducing STIs and containing HIV.

99. Huh, S., J. Yu, et al. (2006). "Intestinal protozoan infections and echinococcosis in the inhabitants of Dornod and Selenge, Mongolia (2003)." Korean Journal of Parasitology 44(2): 171-174.

Purpose: To determine the prevalence of intestinal parasitic infections and echinococcus in the inhabitants of rural Mongolia. **Method:** Stool examinations and analysis of serum for intestinal parasites and echinococcosis. **Target population:** Residents of Tsagaan ovoo Soum, Dornod aimag and Orhon tuul Soum, Selenge aimag. **Sample:** 165 stool samples and 683 serum samples **Findings:** C. parvum(1.2%), E. coli (4.2%), G. lamblia (0.6%) were found in this population. Helminth ova were not found in any stool samples. The seropositive rate of echinococcosis in Orhon tuul soum was 11.7% - higher than previous reports. Echinococcosis ELISA positive cases were detected in 9.1% of sera. Recommendations: Clarification is needed on the status of parasitic infections in Mongolia. Drinking water needs to be monitored and follow up is required.

100. Janes, C., O. Chuluundorj, et al. (2006). "Poor medicine for poor people? Assessing the impact of neoliberal reform on health care equity in a post-socialist context." Global Public Health 1(1): 5-30.

Purpose: To explore how health reform effects health care in post-socialist Mongolia **Method:** mixed method, household based study of low-to-middle income communities (urban and rural). In addition practitioners and policy makers were interviewed including focus groups with family doctors, interviews with heads of FGP in UB and provinces, interviews with 59 practitioners and observations of clinical treatment. **Target population:** Practitioners and policy makers, heads of households **Sample:** 16 family doctors (focus groups); 59 practitioners; 106 households **Findings:** Health care is reasonably accessible to all but the very poor. The poor are disadvantaged because they pay a higher proportion of their income for health care and have more barriers to health care which puts them at higher risk of further impoverishment as a result of illness. For the vulnerable poor, access beyond primary care is comprised because of financial and informational limitations. Family doctors are frustrated by their lack of access to drugs and basic diagnostic services. Physicians also commented on the inability of the poor to follow medical advice. The family group practices do not have sufficient financial, diagnostic or treatment resources to provide care to the very poor. Patients do not believe that their physicians can provide adequate care.

101. Khishigsuren, Z., G. Tsetsegdary, et al. (2006). A report of the assessment of the mental health system in Mongolia using the WHO - Assessment Instrument for Mental Health Systems (WHO-AIMS). Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Center for Mental Health and Narcology; Health Sciences University of Mongolia.

Purpose: To collect information on and assess Mongolia's mental health system in order to improve the mental health system and to provide a baseline for monitoring the change. This is meant to enable Mongolia to develop information-based mental health plans with clear baseline information and targets. It will also be useful to monitor progress in implementing reform policies, providing community services, and involving users, families and other stakeholders in mental health promotion, prevention, care and rehabilitation. **Method:** Used the WHO Assessment Instrument for Mental Health Systems (WHO-AIMS). **Sample:** Data was collected from all of the mental health facilities in the country and from 60 other related organizations. **Findings:** Found that there are 35 outpatient facilities, 7 day treatment facilities, 12 community residential facilities, 21 community-based psychiatric inpatient units and one mental health hospital in Mongolia. Access to mental health care is uneven across the country (favours those in UB). Only 17 mental health care professionals per 100 000 pop. Rates are particularly low for psychiatrists, psychologists and occupational therapists and there are no social workers in mental health facilities. There has been some (limited) training of primary health care staff but such providers have limited interaction with mental health providers. Mental health statistics are collected by facilities to a variable extent but there is no summary report for these data and little research on mental health has been published in indexed journals.

102. Kneighley, E. (2006). Khan ta selekh bain ve? - Where are you swimming?: The impact of the leather tanning industry on the Tuul River, Ulaanbaatar, Mongolia, and public health implications. Atlanta, Georgia; Ulaanbaatar, Mongolia, Rollins School of Public Health, Emory University; School of Public Health, Health Sciences University of Mongolia: Unpublished - Work in progress.

Purpose: To assess the impact of the local leather tanning industry on water quality of the Tuul River and potential implications for public health. **Findings:** Write-up in progress.

103. Komatsu, F., Y. Kagawa, et al. (2006). "Investigation of oxidative stress and dietary habits in Mongolian people, compared to Japanese people." Nutrition and Metabolism 3(21).

Purpose: To investigate the state of oxidative stress and dietary habits of Mongolians. **Method:** The levels of reactive oxygen species were measured using d-ROM. Interviews were conducted about dietary habits using the Food Frequency Questionnaire. **Target population:** Health Mongolians between the ages of 24-66 from Murun city. **Sample:** 164 subjects - 24-66 years old randomly selected. (Compared to results from 220 Japanese subjects from Tokyo) **Findings:** Although the group from Murun did not seem to be nutritionally deficient, they showed high ROM levels. ROM levels were very high even in young ages and ROM levels were higher than in the Japanese. Murun subjects also did not show a difference in ROM levels between smokers and non-smokers

or drinkers and non-drinkers therefore other factors might be involved. Murun subjects eat fewer fruits and vegetables and had lower vitamin C levels. These high levels of oxidative stress may cause early aging and contribute to lower life expectancy than the Japanese.

104. Mathers, B., A. Wodak, et al. (2006). A Rapid Assessment and Response to HIV and Drug Use in Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Australian National Drug and Alcohol Research Centre: 70 pages.

Purpose: To strengthen the development of national strategies and responses to drug use and HIV/AIDS and to provide guidance to the Ministry of Health and World Health Organisation Country Office in Mongolia on how to support such activities by assessing the extent/nature of drug use, risks of HIV transmission related to drug use, existing interventions to address HIV/AIDS and drug use. **Method:** Mixed methods were used - including literature reviews, stakeholder analysis, site visits, meetings with key informants (law enforcement and government officials), interviews with IDU and other drug users, focus groups with men having sex with men, and training/capacity building with NGO and MOH employees. **Target population:** Stakeholders in HIV and drug use, law enforcement and government officials, drug users (IDU and other). **Sample:** 23 IDU and 20 other drug users, other numbers not listed. **Findings:** Injecting drug use is still quite rare in Mongolia but there may be a large number of hidden IDU. There is a significant number of patients with chronic non-malignant pain being prescribed morphine for IV or IM administration daily. Many key informants suggested that the increasing numbers of migrant workers, particularly from China employed in the construction and mining industries, may represent a population where injecting drug use and HIV infections may occur. 11 of the 25 (44%) reported cases of HIV infection in Mongolia also had Syphilis or Gonorrhoea so that there is a need to rapidly expand the STI policy and practice.

105. Morgan, A., R. Young, et al. (2006). "Prevalence Rate of Myopia in Schoolchildren in Rural Mongolia." Optometry and Vision Science 83(1): 53-5.

Purpose: To determine a prevalence rate of myopia for school children in rural Mongolia. **Method:** Eye examinations including retinoscopy, subjective refraction, best-corrected visual acuity, and direct opthalmoscopy. **Target population:** School children in 2 remote, rural soums - one in Khovd, one in Zavkhan **Sample:** 1057 school children between 7 and 17 years (74% of the total population living in these 2 soums). **Findings:** 5.8% of children were found to be myopic in one or both eyes. In females the prevalence rate was 8.3% and in males it was 3.1% and was significantly higher in females. The prevalence in Mongolia is low in comparison to other Asian countries.

106. Munkhuu, B., T. Liabsuetrakul, et al. (2006). "Antenatal care providers' practices and opinions on the services of antenatal syphilis

screening in Ulaanbaatar, Mongolia." Southeast Asian Journal of Tropical Medicine and Public Health 37(5): 975-982.

Purpose: To review antenatal syphilis screening and to assess antenatal care providers' practices and opinions in Ulaanbaatar, Mongolia. **Method:** Cross-sectional study (interviews) **Target population:** Pregnant women in Ulaanbaatar. **Sample:** All 16 antenatal care clinics and a random selection of 30 family units from 6 districts in Ulaanbaatar. Interviews with 150 antenatal care providers and 27 antenatal care heads/leaders. **Findings:** The main conclusions concerning the failure of universal antenatal syphilis screening were limited accessibility and feasibility of the service, and the ignorance of both women and providers on the importance of screening. It was agreed that decentralization of antenatal syphilis screening would improve the system.

107. Munkhuu, B., T. Liabsuetrakul, et al. (2006). "Coverage of Antenatal Syphilis Screening and Predictors for Not Being Screened in Ulaanbaatar, Mongolia." Sexually Transmitted Diseases 33(5): 284-288.

Purpose: To measure the coverage of antenatal syphilis screening and identify factors related to women not being screened in order to assess the syphilis control program in Mongolia. **Method:** Part 1-Retrospective review of antenatal care records (ANC) and a cross-sectional interview study with postpartum women - raw data obtained from ANC records of all 16 ANC clinics (Jan 2002-Jan 2003). Part 2- Interviews of postpartum women at 3 maternity homes and maternity and child health (MCH) centers from June 2003-Sept 2003 to identify potential predictors for not being screened. **Target population:** Pregnant and post-partum women in Ulaanbaatar. **Sample:** 3519 ANC records, 445 women interviewed (267 screened and 178 unscreened). **Findings:** Part 1-Found that 78% of women that received ANC were screened for syphilis. About 20% of women attended the ANC clinic for the first time at 28 weeks of gestation. Among these women, 54.8% were unscreened. Part 2-The unscreened group was more likely to be unmarried, have lower education level, reside outside UB, report risky sexual behaviour, and less knowledge on the infection and antenatal syphilis screening (ASYS) and to live far away from ANC and ASYS clinics. Despite free ASYS about 25% of women did not get it, and almost one fifths of women who were screened had it too late. The syphilis screening in pregnancy is inadequate. The average coverage in UB is still too low.

108. Narangerel, G., J. Pollock, et al. (2006). "The effects of swaddling on oxygen saturation and respiratory rate of healthy infants in Mongolia." Acta Paediatrica 96: 261-265.

Purpose: To compare respiratory rates (RR) and arterial oxygen saturations (SaO2) of healthy swaddled infants and non-swaddled infants during different conditions of sleep and arousal. **Method:** Community based, nested case-control study in Ulaanbaatar. Randomised control trial of swaddling. **Target population:** Healthy 9-10 week old infants in Mongolia. Sampling frame: 516

healthy infants (> or = 37 weeks gestation and > or = 2500 g) aged 9-10 weeks born in 4 maternity hospitals in Ulaanbaatar. **Sample:** 53 swaddled infants and 30 non-swaddled infants. 3 infants subsequently excluded from analysis - all from the swaddled group. **Findings:** Swaddling has little or no clinical effect on SaO2 or respiratory rates in healthy 9-10-week-old infants in Mongolia. Recommendation: Further studies are required to define the effects of swaddling during stress of the respiratory system, which may occur with acute respiratory infections.

109. Naranjerel, G. (2006). Curricular Review Report on Adolescent Health and Development Concepts in the Medical School and Colleges' Pre-service Program. Ulaanbaatar, Mongolia, Health Sciences University of Mongolia: 7 pages.

Purpose: To define the importance of health professionals' competencies, inclusion of the competencies in curriculum and teaching-learning and evaluation needs to further develop/modify the curriculum of medical schools and colleges. **Method:** Competencies checklist distributed to Directors, Officers of Center of Academic Affairs and teachers of Medical Schools and Colleges. **Target population:** Directors, Officers of Center of Academic Affairs and teachers of Medical Schools and Colleges. **Sample:** HSUM (Pediatric, GP, Obstetrics/Gynecology, Infectious Diseases, Psychiatric Departments) and 4 Medical Colleges. **Findings:** Competencies strongly included are Sexuality and Reproductive Health and Psychosocial and Physiologic Well-Being, competencies weakly included are: Professional Development, Healthy Behaviours and Lifestyles.

110. Narantuya, G., M. Altankhuu, et al. (2006). Needle stick and sharp injuries (NSSI) in health care workers in some hospitals of Ulaanbaatar City. Ulaanbaatar, Mongolia; Tokyo, Japan, National Center for Communicable Diseases; Ministry of Health; Department of Health Policy and Planning, School of International Health, University of Tokyo: Abstract.

Purpose: To analyze the prevalence and assess the knowledge, attitudes and practices (KAP) of health care workers regarding needle stick injuries (NSSI) in hospitals in UB, Mongolia. Also, tried to determine the circumstances and types of injuries from needle sticks. **Method:** Cross-sectional survey; semi-structured questionnaire. **Target population:** Health care workers in UB city hospitals. **Sample:** 621 health care workers in 2 UB city hospitals - NCCD and Hospital 3 (i.e. physicians, surgeons' nurses, lab assistants, housekeepers). **Findings:** Health care workers working 3 or more night duties/week and more than 36 hours of duty/week were more prone to injuries. The prevalence of NSSI in both hospitals was 84% and the majority of injuries occurred among nurses, followed by lab assistants and housekeepers. 80% of those injured did not report injury to hospital administration and 75% did not seek treatment. Found that the majority had no training on NSSI and that incidence of injuries was less among

trained health workers. **Conclusion:** the prevalence of NSSI among health workers in UB city hospitals health care workers was very high.

111. Narantuya, L., I. Bolormaa, et al. (2006). Survey on prevalence of non-communicable disease risk factors in Mongolia (Mongolia NCD STEPS survey) Ulaanbaatar, Mongolia, Public Health Institute; Ministry of Health; World Health Organization.

Purpose: To determine the prevalence of major NCD risk factors and establish the baseline information for the surveillance of NCDs prevention and control. Specific **Objectives:** To determine the prevalence of behavioural (primary) NCD risk factors; some NCD and intermediate NCD risk factors (i.e. blood glucose, cholesterol, triglyceride levels); to conduct a comparative study on the prevalence of major NCD risk factors stratified by age, gender and locality; establish the baseline information on these risk factors. **Method:** Nationwide, cross-sectional survey (UB city and other aimags) from Sept-Oct 2005. **Target population:** Mongolian population aged 15-64 years. **Sample:** Survey data collected from 3445 individuals and 3411 valid participants aged 15-64 years. **Findings:** 9 out of every 10 people had at least one of the major risk factors demonstrating that NCD risk is widely distributed in Mongolia and that 1 in every 5 people, in particular men were at high risk of developing NCDs. Proportion of current daily smokers was 10 times (43%) higher in men than in women (4%). 28.1% of those surveyed had hypertension, 8.2% had diabetes mellitus, and 9.8% were classified as obese. Thus, prevalence of CVD, cancer and diabetes mellitus is expected to increase in the future. Results will serve as a baseline information for the prevalence of major NCDs and their associated risk factors.

112. Naryad, S., N. Suvdmaa, et al. (2006). Epidemiological analyses of reported cases of dysentery in Ulaanbaatar city as of June 2006. Ulaanbaatar, Mongolia, National Center for Communicable Diseases; Ministry of Health: Abstract.

Purpose: To determine the epidemiology of dysentery in Ulaanbaatar City as of Jun 2006. **Method:** Cross-sectional study of reported cases of dysentery. **Target population:** Population of Ulaanbaatar. **Findings:** The incidence of dysentery in children under 5 in Ulaanbaatar is the highest among reported cases in UB - 13 per 100 000. Children who do not attend kindergarten, pensioners and unemployed people are the groups with the highest rates of dysentery in UB.

113. Radnaabazar, J. and G. Soyolgerel (2006). Disability and mental retardation among school-aged children of Ulaanbaatar, Mongolia. Ulaanbaatar, Mongolia, State Center on Maternal and Child Health; Ministry of Health; World Health Organization: 40 pages.

Purpose: To gather baseline data on disability and mental retardation among school-aged children in UB city. To determine the prevalence of disability

among school-aged children and to determine the most prevalent disabilities in this group. **Method:** Cross-sectional descriptive study - secondary data review and survey of "special" school children in UB. **Target population:** School aged children (age 7-18 years) and school aged children from special schools (age 7-19). **Sample:** 2 regular secondary schools - 2 of 9 districts of UB randomly selected; randomly selected 1 secondary school from each of these districts; all students in these schools were recruited. 6 special schools - all eligible students from all 6 'special' schools were recruited (no sampling). **Findings:** 17223 of 186186 (92.5 per 1000) secondary school students reported to have a disability. Most prevalent disabilities in order: visual, hearing/speech, locomotion, mental, other. The most commonly detected type of disability among "special" school students was mental disability (68.9%) followed by speech (27.3%). The most common type of mental disability was mild mental retardation (99.5%). Genetic diseases were the main disabling conditions accounting for 20.2% of all students with disability, followed by congenital/prenatal factors (17.1%), and disease/illness factors (12%). 42% of disabilities had an unknown etiology. **Conclusion:** that the prevalence of disabilities among school aged children is high. Concluded that the findings could not be generalized to the whole population of school-age children or to children in Mongolia because many disable and mentally retarded children are not in school.

114. Saijaa, N., A. Enkhjargal, et al. (2006). Ulaanbaatar city's air pollution, cost effectiveness and cost benefit analysis. Ulaanbaatar, Mongolia, Public Health Institute; Ministry of Health; Ulaanbaatar City Governor's Office; Soros Foundation: Abstract.

Purpose: To conduct a cost effectiveness and cost benefit analysis of decreasing air pollution in Ulaanbaatar city. To develop an information network based upon current and evidence based information about air pollution and its damages for stakeholders and the public. **Method:** Cost-benefit analysis, 'white mushroom' ecological and financial estimation, and a literature review. **Target population:** UB city. **Findings:** If 1.1 billion tugrugs per year were spent on prevention, after 10 years respiratory disease cases would decline by 20-25%, resulting in a savings of 12.5 billion tugrugs. In terms of ecological damage, it is estimated that there was 12.5 billion tugrugs worth of damage due to air pollution in the past 8 years (mushroom estimation) and 50 billion tugrugs of ecological damage due to air pollution overall. It is estimated that 12.4 billion tugrugs are required for intervention efforts to reduce air pollution in 2006-2008. **Conclusion:** It is possible to decrease ecological damage in UB by decreasing air pollution. More cost-benefit analysis is required on air pollution in UB.

115. Saranchimeg, T., D. Naranbayar, et al. (2006). A study on the implementation of regulation on injection practices. Dornod Aimag, Mongolia, Regional Diagnostic and Treatment Center, Dornod Aimag: Abstract.

Purpose: To assess the implementation of regulation on injection practices in the Regional Diagnostic and Treatment Center of Dornod aimag and to find out what constraints exist in terms of implementation and how implementation can be improved. **Method:** Questionnaire survey, observation of injection practices, and analysis of bio-chemical laboratory data of health personnel. **Target population:** Health personnel at RDTC in Dornod aimag. **Sample:** 48 nurses from 11 wards at the Regional Diagnostic and Treatment Center of Dornod aimag. **Findings:** 40% of nurses studied were not aware of the injection practice regulation and 50% of the items stated in the regulation have not been practiced by nurses at all. The supply of injection safety boxes was insufficient and poor implementation of the regulation poses a high risk of infection for the nursing staff. The needle stick injury rate was found to be 2.7 per nurse and 14 out of 19 nurses who were tested biochemically were found to be carriers of the hepatitis virus. **Conclusion:** Need to strengthen implementation of the regulation, conduct training, organize the examination of health personnel for hepatitis and vaccinate against hepatitis, and increase the availability of safety boxes.

116. Sergelen, O. (2006). Report of Joint Training Course of WHO, Ministry of Health, HSUM and SST for Mongolia on "Strengthening Essential Emergency Surgical Care Procedures in Mongolia". Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Health Sciences University of Mongolia; Swiss Surgical Team (SST): 6 pages.

Purpose: To identify causes of mortality following emergency surgery in 2005. **Method:** Analysis of post operative records. **Sample:** 48 post-operative mortality charts. **Findings:** The main causes of morbidity and mortality following surgery are delayed seeking of treatment, waiting times between 24-72 hours at the hospital, errors during surgery and mistakes in post-operative care.

117. Sergelen, O. and S. Dashtsogt (2006). Actual Situations of Complications after Emergency Abdominal Surgery. Ulaanbaatar, Mongolia, Health Sciences University of Mongolia: 7 pages.

Purpose: To determine the lack of emergency surgical service in rural areas and factors which cause this shortage. To determine the percentage of postoperative complications and deaths due to emergency surgery among the total number of dead and postoperative complications. To determine the etiology the deaths due to emergency surgical disease in 2006. **Method:** Analysis of hospital records. **Target population:** Patients with emergency abdominal surgery. **Sample:** 48 post-operative cases with complications. **Findings:** Rates of complications from abdominal surgery are not declining. Patients wait too long before going to the hospital and the wait time for emergency surgery at the hospital is greater than the recommended 4 hours.

118. Shirnen, L. and B. Bulganchimeg (2006). Hospital Management Training Effectiveness and Its Further Needs. Ulaanbaatar, Mongolia, Ministry of Health, Mongolian National Center for Health Development, Health Management Academy: 31.

Purpose: To evaluate the results of the "hospital management" training course organized for hospital managers and to identify further training needs. **Method:** Questionnaires were given to 50 managers, 50 medical officers and 100 clients from participating aimags and 50 managers, 50 medical officers and 100 clients from non-participating aimags.10 focus groups were held with management team representatives and department heads. **Target population:** Hospital managers, Medical Officers and Clients. **Sample:** 200 managers to participate in training, 100 managers for questionnaires, 100 medical officers and 200 clients. **Findings:** The training was effective. Participating aimags received higher evaluation rates from clients.

119. Shurentsetseg, S. and J. Kupul (2006). Usage and hygienic assessment of chlorine compounds. Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine the level of usage of chlorine compounds in Mongolia and its health effects. **Method:** Meta-analysis. **Target population:** The population of Mongolia. **Findings:** There is widespread use of chlorine compounds in Mongolia and this constitutes a serious hazard to the health of all contingents of the entire population of Mongolia. This is because of multiple routes of entry of chlorine into the human body, their high toxicity, accumulation and carcinogenic effects. Recommend the development of hygienic recommendations on the safe usage of disinfectant substances, chlorine compounds and chlorinated water.

120. Suvd, B., D. Baasanjav, et al. (2006). Autopsy analysis of the causes of hospital mortality among elderly at Shastin Clinical Hospital during 2002-2005. Ulaanbaatar, Mongolia, Mongolian Medical Research Institute; Shastin Clinical Hospital: Abstract.

Purpose: To analyze the autopsy data to determine the causes of deaths among patients 60 years old or older who died between 2001-2005. **Method:** Analysis of autopsy data **Target population:** Cases of elderly death within Shastin Clinical Hospital **Sample:** 122 cases **Findings:** The main causes of mortality among elderly patients were stroke, acute myocardial infarction, ischemic heart diseases. Liver cirrhosis, acute abdomen disorder and degenerative bronchial diseases were also common.

121. Suvd, B., D. Uranchimeg, et al. (2006). Factors influencing fertility in Mongolia. Ulaanbaatar, Mongolia, Public Health Institute: Abstract.

Purpose: To determine social, economic, psychological and cultural factors influencing fertility in Mongolia and to develop evidence-based

recommendations on perspectives and possibilities to regulate fertility. **Method:** Meta-analysis of existing data, quantitative survey, qualitative survey based on individual and group discussions. Data analyzed at 3 levels: Ulaan Baatar city, aimag center and rural area. Study population: Quantitative sampling using multi-stage sampling methods - sampling frame comprised the list of households per baghs and khoroos. Site: Ulaan Baatar city, and Dornod, Khuvsgul, Uvs, and South Gobi aimags. **Findings:** Decrease in fertility since 1990 was not related to the lack of interest of women having children but to the fact that families are starting to limit the number of children. Key factors influencing fertility rate: gender imbalance; women's education and their social and employment status; an increase in numbers of internal and external migration for short and long terms. Major factor influencing fertility: age at first marriage; age at first childbirth; position of head of household.

122. Tserendogor, U. (2006). Dietary factors that affected calcium intake and vitamin D status in Mongolian adolescent children. Ulaanbaatar, Mongolia, Public Health Institute; National Research Council: Abstract.

Purpose: To investigate nutritional factors associated with vitamin D deficiency and calcium intake in Mongolian adolescent children. **Method:** Cross-sectional study - dietary data, nutrient intake and analysis of plasma samples to determine vitamin D status and DBP concentration. **Target population:** Mongolian adolescents. **Sample:** Random sample of 120 healthy children (115 plasma samples collected to determine vitamin D status, 56 samples randomly selected and analyzed for DBP concentration). **Findings:** The plasma concentration of vitarnin D (25(OH)D) was less than 18 mmol/l in 28.6% of studied adolescents and levels in winter and spring were lower than those in summer. The DBP concentration values were low in 53.6% of adolescents studied. Dietary factors (protein intake, calcium intake, potassium and magnesium intake, consumption of dairy products) may be affecting calcium intake of adolescents.

123. Tserenpuntsag, B. (2006). Prevalence and risk factors of hepatitis B and C infections in blood donors, Mongolia. Albany, State University of New York at Albany. PhD: 173 pages.

124. Tsetsegdary, G. and P. Anderson (2006). Epidemiological study on prevalence of alcohol consumption, alcohol drinking patterns and alcohol related harms in Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; Center for Mental Health and Narcology.

Purpose: To determine the prevalence of alcohol consumption, alcohol drinking patterns and alcohol related harms among the Mongolian population. The results are to be used in improving the implementation of the "National program on alcohol prevention and control (2003)" and also to help in the development of social, health and mental health policy in Mongolia. **Method:**

Cross-sectional survey (face-to-face interviews). **Target population:** Mongolian population aged 15-65 years. **Sample:** Quota sample obtained from 8 provinces and 2 districts of UB. Respondents: 10 157 people (5116 male, 5006 female) interviewed and of these, 10 145 (99.8%) provided valid data. **Findings:** Found that 13.6% of the total population met the criteria of being dependent on alcohol (a score of 4 or more on the Composite International Diagnostic Interview instrument) - 22.5% of men and 5% of women. The level of daily, weekly and monthly episodic heavy drinking was very high. The mean alcohol consumption of men was almost 3 times higher than that of women. Most respondents reported social problems related to alcohol use. Average amount of money spent in the last month on buying alcohol was high compared with an average low family income of respondents in our survey.

125. Tseveensuren, T., Z. Sainjargal, et al. (2006). Determination of the distribution of non-polio enterovirus among children under 5 years of age in Ulaanbaatar City. Ulaanbaatar, Mongolia, Public Health Institute; Biotechnology Production, Research and Training Centre: Abstract.

Purpose: To determine the distribution of non-polio enterovirus among children under 5 in UB city, Mongolia. **Method:** Collection of stool samples from healthy children under 5 analyzed for enteroviruses. **Target population:** Mongolian children under 5 living in UB city. **Sample:** 651 health children under 5 with other clinical symptoms. **Findings:** Found non-polio enterovirus in 107 of tested samples. The percentage of non-polio enterovirus was highest among children under 5. Enterovirus is distributed widely in UB City and this might be due to environmental factors such as soil and water pollution. It was shown that there is a high probability of morbidity associated with infection by enteroviruses. Non-polio enterovirus ECHO-virus was the most common type of non-polio enterovirus found among children under 5.

126. Tsevelmaa, S. (2006). Impact of nutritional status on the diarrheal diseases in children. Ulaanbaatar, Mongolia, Khan-Uul District Hospital: Abstract.

Purpose: To evaluate the effect of feeding infants by breast milk compared with formula with lactose during an acute diarrheal episode. **Method:** Quasi-experimental design; children admitted to hospital with acute diarrhea and severe dehydration (categorized as breastfed or bottle-fed) and their total output (stool, urine, vomit) was measured throughout their illness. **Target population:** Mongolian infants under 12 months old. **Sample:** 44 children aged <12 months (16 breastfed, 28 bottle-fed) admitted to the Khan-Uul district hospital with acute diarrhea and severe dehydration were enrolled in the study. **Findings:** There was a difference in the amount of urine produced by breastfed and bottle-fed children. Due to dehydration and the imbalance of the metabolism, the amount of urine was decreased in bottle-fed children. During diarrheal episodes, children who are breastfed have better outcomes than those who are bottle-fed.

127. Ulziiorshikh, L. and J. Narantuya (2006). Rapid assessment of sex work in Ulaanbaatar city. Ulaanbaatar, Mongolia, National AIDS Foundation; Mongolian Public Health Professionals Association; Global Fund.

Purpose: To assess the sex work situation in UB; to develop maps on locations of sex workers; to make recommendations for further programs on prevention of HIV infection among sex workers and their clients. **Method:** Rapid assessment (qualitative and quantitative methods). Quantitative - survey questionnaire; qualitative - focus groups; literature review and estimation, mapping. **Target population:** Sampling frame was female sex workers in UB ("female adults and young people who receive money or goods in exchange for sexual services, either regularly or occasionally"). **Sample:** 6 districts in UB selected to conduct rapid assessment. Snowballing sampling method; 115 sex workers were interviewed. Key **Findings:** Sex workers have insufficient access to health care services due to barriers such as service fee, lack of information on where to go, no registration documents, bad communication skills of service providers, inconvenient timing, etc.

128. Urnaa, V., M. Kizuki, et al. (2006). "Association of swaddling, rickets onset and bone properties in children in Ulaanbaatar, Mongolia." Public Health 120(9): 834840.

Purpose: To examine the influence of duration of completely or partially wrapped swaddling on rickets onset and bone properties in children of school age. **Method:** Case-control study. The periods of completely and partially wrapped swaddling, rickets onset and age-standardized mid-tibial cortical speed of sound (TCSOS) were examined. **Target population:** School aged children (7 - 10 years) living in Ulaanbaatar, Mongolia. **Sample:** 73 children aged 7-10 years with a history of rickets (cases) and 70 children aged 7-10 years with no history of rickets (controls) in Songino-Khairhan district, UB. **Findings:** The practice of swaddling itself neither influences rickets onset nor bone properties in school-aged children in Ulaanbaatar.

129. Zulkhuu, G., O. Baatarkhuu, et al. (2006). Epidemiology and clinical features of acute viral hepatitis D. Ulaanbaatar, Mongolia, National Center for Communicable Diseases; Ministry of Health: Abstract.

Purpose: To ascertain the epidemiological and clinical features of acute hepatitis D in Mongolia. **Method:** Survey and clinical diagnosis. **Target population:** Mongolia. **Sample:** 32 patients admitted and diagnosed with hepatitis D aged 0-40. **Findings:** Acute hepatitis D occurred predominantly in teenagers and among young people. Acute hepatitis D is most commonly seen in icteric forms and prolonged course. The mean route of transmission of HDV infection needs to be investigated further.

130. Zurba, O. M., A. V. Rozhanskaya, et al. (2006). Hygienic assessment of fluoride contamination of snow in the aluminum production region. Angarsk, Russia, Research Institute of Occupational Medicine and Human Ecology, Scientific Centre of Russian Academy of Medical Sciences, Russia: Abstract.

Purpose: To determine the fluorine ionic content of snow in areas surrounding aluminum production plants and to compare these values to the permissible exposure limits in the workplace and in the atmosphere. **Method:** Fluorine ion contents measured using an electrochemical method (ACIDIMETR 333 and citrate bupheric solution). **Target population:** populations residing in close proximity to aluminum production plants in Mongolia. **Findings:** The vicinity of aluminum production plants has been highly polluted with fluorine. The maximum level of pollution is 2.6-2.8 times for than the permissible level. The fluorine ion content in the snow surrounding aluminum plants is high enough to penetrate the human body.

131. Purevjav, N., P. Javhlan, et al. (2006-2007). The Oral Health Condition of 12 Year Old School Children in Mongolia. Ulaanbaatar, Mongolia, World Health Organization; Ministry of Health; State Dental Center of Mongolia; Mongolian Dental Association; School of Dentistry, Health Sciences University of Mongolia: 29 pages.

Purpose: To study the oral health condition of 12 year old school children in Mongolia. **Method:** Questionnaires and examinations. **Target population:** 12 year old school children in Mongolia **Sample:** 887 twelve year old school children. **Findings:** Oral health was worse in rural areas. In general, very few cavities are treated especially in the rural areas.

132. (2007). Mongolia: Multiple Indicator Cluster Survey, 2005-2006, Key Findings. Ulaanbaatar, Mongolia, UNICEF; National Statistical Office of Mongolia: 31 pages.

Purpose: To provide internationally comparable data for monitoring the situation of women and children in Mongolia. **Method:** Interviews **Target population:** Mongolian Women **Sample:** 6220 Households, 7459 women aged 25-49, 3547 interviews with mothers/caretakers of children under 5 **Findings:** Since 2000, the number of underweight children has been reduced by half but stunting remains the most prevalent form of malnutrition. Diarrhea is the second leading cause of death among children aged 1-4 and 2 in 3 children received oral rehydration therapy (boys less likely than girls and urban children less likely than rural). 99% of pregnant women received at least one antenatal care visit and almost all births were attended by a physician/nurse/feldsher.

133. Altankhuyagiin, G., J. Falkingham, et al. (2007). "Determinants of current contraceptive use and method choice in Mongolia." Journal of Biosocial Science Epub ahead of print: 1-17.

Purpose: To examine the determinants of current contraceptive use and method choice in Mongolia. **Method:** Cross-sectional study using data from the 1998 Mongolian Reproductive Health Survey and 2000 Mongolian Population and Housing Census. Analysis of: a) current contraceptive use and b) contraceptive method choice. **Target population:** Mongolian women of reproductive age who were married and not pregnant or sterilized at the time of the survey. **Sample:** a) 4500 women between the ages of 15-49. Bags and horoos were the primary sampling units; b) sample further restricted to 2845 women currently using contraception. **Findings:** There were some increases in the use of modern contraceptives among married women in the 1990s; however, at the start of the twenty-first century the IUD and periodic abstinence remain the most widely used methods. Women with higher levels of education are more likely to be current users of contraception, and if they are current users, they are more likely to choose the IUD and traditional methods. Women living in rural areas have a higher probability of using contraception and are more likely to choose the IUD and traditional methods. Significant variations exist between primary sampling units in current contraceptive use and in the choice of modern methods. Community-level variables were important predictors in reducing variation between primary sampling unit, when other modern methods were compared with traditional methods.

134. Davaalkham, D., T. Ojima, et al. (2007). "Seroepidemiology of hepatitis B virus infection among children in Mongolia: results of a nationwide survey." Pediatrics International 49(3): 368-374.

Purpose: to describe the seroepidemiology of HBV infection among primary school children in Mongolia. **Method:** nationwide school-based cross-sectional serosurvey (serum samples tested). **Target population:** children aged 7 - 12 years attending public elementary schools in Mongolia. **Sample:** random cluster sampling from all public elementary schools (n=593); serology results available for 1145 children aged 7 - 12 years. **Findings:** The prevalence of chronic HBV infection has been decreasing in the Mongolian young generation, most likely due to infant HB vaccination. However, significant rural-urban differences in the prevalence of HBV infection were found that demand further investigation to estimate potential causes. Recommendations: Significant rural-urban differences in the prevalence of HBV infection were found that demand further investigation to estimate potential causes.

135. Davaalkham, D., T. Ojima, et al. (2007). "Impact of the universal hepatitis B immunization program in Mongolia: achievements and challenges." Journal of Epidemiology 17(3): 69-75.

Purpose: To assess the impact of the universal infant hepatitis B (HBV) immunization program initiated in 1991 in Mongolia. **Method:** Nationwide school-based cross-sectional serosurvey. **Target population:** children aged 7 - 12 years attending public elementary schools in Mongolia. **Sample:** random cluster sampling from all public elementary schools (n=593); serology results available

for 1145 children aged 7 - 12 years; immunization card available for 702 (61.3%) children. **Findings:** The coverage of complete HB vaccination was 60.1% and increased by birth cohort from 44% to 76%. The prevalence of HBV infection and carriage among the young generations has meaningfully declined compared with previous studies carried out in Mongolia. The coverage of birth dose and complete HB vaccination was significantly low in Province centers and rural areas. Recommendations: The findings that HBV vaccination coverage is significantly lower in province centers and rural areas when compared to metropolitan areas/cities should be taken into consideration.

136. Hagan, J. E. and D. Nyamkhuu (2007). "Risk factors and Prevalence of HIV and Sexually Transmitted Infections Among Low-Income Female Commercial Sex Workers in Mongolia." Sexually Transmitted Diseases 34(2): 83-87.

Purpose: To assess the prevalence and risk factors associated with the acquisition of HIV, syphilis, gonorrhea, and trichomoniasis among low-income female commercial sex workers in 3 urban centers in Mongolia. **Method:** Cross-sectional study involving a questionnaire and HIV, syphilis, gonorrhea and trichomoniasis testing. **Target population:** low-income female commercial sex workers in 3 urban centers of Mongolia. **Sample:** 179 low-income FSWs tested for HIV; 132 tested for syphilis, gonorrhea and trichomoniasis; 149 completed the questionnaire. Participants recruited in June and July 2002. Participants had to be over 16 and charge less than 25,000 tugrug per sexual contact. **Findings:** No HIV infections were found in 179 women. Of 132 women, 57 (43%), 18 (14%), and 37 (28%) tested positive for syphilis, gonorrhea and trichonomiasis, respectively. 88 (67%) tested positive for one or more STIs and 22 (17%) had multiple infections. Socioeconomic factors were correlated to reported condom use and infection status. Data suggest that previous sampling efforts may be significantly underestimating the rates of STIs among FSWs in Mongolia.