MEDIUM TERM STRATEGIC PLAN

FOR THE DEVELOPMENT

OF THE HEALTH SECTOR IN DPRK

2010 – 2015

Ministry of Public Health in partnership with WHO

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FOREWORD

EXECUTIVE SUMMARY

Vision: "Improved health of the population through enhanced access to higher quality health care services and healthier living environments"

Background

The Medium Term Plan for Development of the Health Sector in DPR Korea 2010 to 2015 was developed between November 2009 and June 2010. This plan was developed in response to the need to describe a long term vision and strategy for the sector, as well as to assist with coordination and mobilization of health resources to address significant health development needs for population of DPR Korea in order to achieve the Millennium Development Goals.

In order to support the development of the plan, a roadmap was developed in 2009 that specified specific steps for plan development. These steps included organizing a series of national consultations on strategic framework, objectives and activity setting, monitoring and evaluation and finally costing and financing. A national consultation conference in December 2009 identified major barriers to health system performance.

This situation analysis was supplemented by a thorough review of the health literature and documentation on public health and health systems development in DPR Korea. A draft plan was finalized in April 2010 and disseminated at a national conference with government development partners, after which the draft plan is proposed to be disseminated to the MOPH departments, Provincial level and development partners for further inputs and refinement.

The strategic framework developed for this plan describes 5 strategic areas. In this plan, a situation analysis, strategic area objective, sub objectives for each system area, and priority activities are detailed along with estimated costs, financing gap and monitoring and evaluation strategy.

Situation Analysis

(1) There have been noticeable *public health achievements* in recent years in DPRK, in particular with respect to increased immunization coverage, high rates of completion of TB treatment, and declines in the incidence of malaria and prevalence of childhood malnutrition. There have been selected high program area program achievements, for example in the areas of EPI, malaria prevention and TB DOTS.

(2) Important *health system developments and partnerships* have developed through recent years. The multilateral MOPH and WHO program for improvements in women's and children's health has provided the first framework for a wider vision of health development, which will be accelerated through the GAVI HSS and Global Fund initiatives. Ongoing partnerships with UN agencies (WHO, UNICEF and UNFPA) in

addition to NGO participation has the potential to widen health systems support in coming years.

(3) *Non communicable disease prevalence* is less well documented and researched. What evidence is available (coupled with the fact that DPRK is a highly urbanized country with an aging population) would seem to suggest the need for additional policy and practice emphasis on prevention and management of NCDs.

(4) Despite these system interventions and international partnerships and improved program coverage, and although many of the DPRK health indicators are better than regional averages, these indicators are still significantly lower than what would be expected for a country with this level of educational and social attainment, particularly in relation to *maternal and child health.*

(5) What is consistently reported in the literature is the impact of health systems barriers (HR capacity, operational finance, infrastructure, referral systems, logistics) on health system access right across all national programs and system levels. This calls for a reduction in fragmentation and a need for coordinated and comprehensive efforts for *health system strengthening*.

(6) Equally, factors largely external to the health sector, particularly in relation to *social and environmental determinants of health* relating to food security, economic sanctions, and extreme weather events are all having major impacts on public health, highlighting the need for strengthened inter-sectoral and international partnerships for health development

(7) *Large resource gaps* are suggested for the health sector. It is important to note that national programs such as TB, malaria and immunization have developed multi year plans that identify major cost categories, source of finance and finance gaps. The ability of planners to research and identify costs and financial gaps has no doubt been a critical factor in mobilizing national and international resources for these programs, and is an important lesson learned for sector multi year planning.

(8) In terms of international health and cooperation, there has been a marked growth in external financing of the health sector, reaching a level of 59% in 2007. This provides a strong rationale for development of a *sector wide health planning processes* in order to maximize opportunities for government coordination of development assistance.

(9) There are 4 key areas where *international health developments* will impact on patterns of international collaboration with DPRK. These are (a) pandemic preparedness and response and CDC prevention and control as outlined in the International Health Regulations (b) adaptation planning for management of the health effects of climate change (c) increased focus internationally on the social and environmental determinants of health (d) health system strengthening, in particular for maternal and child health.

(10) Social and environmental factors, some of which are external to the health sector, are having high impacts on population health. Factors internal to the sector include large resource gaps for infrastructure, operations and consumables, and a tendency towards internal fragmentation along program and project lines. Based on very impressive recent public health achievements in DPRK, there is very high potential for

rapid improvement in public health given (a) an easing in external environment factors and strengthened multi sector collaborations (b) improved financing and coordination of health system development and operations.

Strategic Direction and Focus

The fundamental challenge for the health system in DPR Korea is addressing the significant resource gaps and human resource development needs for *strengthening the health system*. There is a high level of focus on mobilization of resources for essential health service needs for *women's and children's health* in particular for areas such as reconstruction and rehabilitation of Ri clinics and county hospitals, provision of referral transport and communication systems, and ensuring life saving essential medicines and equipments, blood safety and laboratories. Expansion of the IMCI strategy, scaling up of essential obstetric care ar Ri and county levels, infrastructure development, blood safety and promotion of water and sanitation at public health facilities are high priorities for enhancing the quality of care and achieving MDG goals 4 and 5.

The medium term Plan for the Development of the Health Sector will also focus on building on the recent gains in *communicable disease prevention and control* in such areas as immunization, TB and Malaria, as well as on maintaining the HIV free status in the country. The important lessons learned from recent successes in communicable disease control have included the development of multi year strategic plans that are fully costed and have clear monitoring and evaluation frameworks. Other factors associated with success in CDC have included extension of international partnerships, capacity building of human resources and successful resource mobilization efforts.

One of the challenges for re development of the sector are the significant infrastructure problems associated with damaged and un-repaired water and sanitation systems. This, along with the impacts of climate change on the environment in DPR Korea, has resulted in a focus in this plan on the *social and environmental determinants* of health. In the initial stages of the plan, a focus will be placed on mobilization of resources for restoration of water and sanitation infrastructure for essential public institutions, in particular health facilities, schools, nurseries and kindergartens. At this stage, vulnerability assessments and adaptation planning are seen as a first step towards developing more comprehensive plans for response to the health effects of climate change. Development of surveillance and response systems for water and food borne disease and emergency preparedness are also high priorities identified in this strategic area.

DPR Korea is over 60% urbanized and has an aging population. For this reason, the *prevention and control of non communicable diseases* is also an identified strategic area. Priority activities proposed in this strategic area are for the reduction of high smoking rates, improvements in services for the elderly and disabled, development of a national NCD strategy and strengthening NCD surveillance systems for clinical signs and risk factors.

The overall approach of the plan will be to maintain existing services and develop pilot programs and national policies and guidelines in the early implementation period. It is then planned to gradually bring strategies to scale following resource mobilization and systems development in this first phase of the plan (Years 1 and 2).

Costs and Financing

The projected costs of the health plan of $ 457 million over the five year period, with a projected finance gap of $306 million (67 % gap). This underscores the urgent need to develop a financing strategy for the Plan. One proposal that will be explored is for the establishment of a *DPRK Health Development Fund* along the lines of successful country experience with this mechanism in similar contexts. Important also is the need to improve efficiency in the health sector through system and financing analysis as well as through the use of annual implementation plans.

Figure 1 Highlights of MTSP 2010 - 2015

Highlights of the Medium Term Plan for Development of the Health Sector

Strategic Area 1 Health System Strengthening

1. Improving quality of care through reconstruction and rehabilitation of health facilities and referral transport and communications across the country
2. Strengthening the primary health care system through IEC programs, capacity building for household doctors and ensuring adequate essential drug and equipment supply to all Ri clinics by 2015
3. Building management and information capacity at provincial and County levels
4. Advocacy for development of innovative financing options including development of a "DPRK Health Development Fund" to mobilize international finance for addressing gaps in the health plan
5. Improving overall stewardship of the sector and increasing the capacity for resource mobilization through establishment of a joint government and development partner health sector forum

Strategic Area 2 Non Communicable Disease Prevention and Control

6. Developing a renewed emphasis on elderly and disability care, and strengthening the capacity of the MOPH at all levels to monitor and treat non communicable diseases (including establishment of a national public health institute for NCD prevention and control)
7. Implementation of programs to reduce adult male smoking rates from 52% to 45% by 2015

Strategic Area 3 Communicable Disease Control

8. Elimination of malaria by 2015
9. Increasing immunization coverage to > 97% for all antigens
10. Maintaining HIV free status
11. Increasing TB case detection rates

Strategic Area 4 Women's and Children's Health

12. Scaling up of IMCI strategy to 100% of counties by 2015
13. Scaling up of emergency obstetric care to agreed standards to 10 out of 12 provinces by 2015

Strategic Area 5 The Social and Environmental Determinants of Health

14. Developing quality water and sanitation systems at 30% of public health facilities by 2015
15. Developing adaptation plans and building emergency preparedness capacity in order to respond to the health effects of pandemics and climate change in DPR Korea

Given the potential for increase in international financing, a *health sector forum* will be established in order to guide coordination and resource mobilization under the leadership of the Ministry of Public Health and in partnership with development partners.

The Commitment to Primary Health Care in DPR Korea

The commitment of the Government of DPR Korea to the development and maintenance of the primary health care system has been substantial. Since its establishment in the 1980s, the health system workforce has developed into 215,727 staff of all categories. In Asia, DPR Korea has the second highest professional health staff to population ratios. Substantial resources are also invested into the pre service education and continuing education programs of this health workforce. For this purpose, there is a Medical University based in each province to provide pre service training. The health sector is also tasked with financing the extensive network of 7726 health facilities across the country. These facilities require equipping, logistical support, renovation and maintenance and operational support.

In order to meet these needs, the Government of DPR Korea commits to increase the domestic financing (as a proportion of GDP) from 5.9% to 7% of GDP during the plan period, as well as explore options for increased international financing for priority health interventions (as outlined above).

Conclusions

Several cross cutting themes emerge from the strategic area development. There are repeated references throughout the plan to improvements in health management systems, particularly in relation to health surveillance and information systems. Health research is a common theme, as is the need to develop updated standards and norms for management and service delivery. The significant resource gaps identified in the plan, particularly for women's and children's health and health systems strengthening, point to a need for innovative approaches to resource mobilization and health financing, strengthening of international partnerships, and the promotion of improvements in the efficiency of the service delivery system.

The foundation of the DPR Korea health system is the household doctor system, universal coverage and the principles of primary health care. In order to take advantage of the strengths of this system, this strategic plan proposes a comprehensive strategic approach, but with a renewed focus on resource mobilization and international partnerships for health systems strengthening and women's and children's health

These steps are likely to place the health sector on a pathway to redevelopment within a context of resource scarcity, in order to realize the long term vision for health in DPR Korea of "improved health of the population through enhanced access to higher quality health care services and healthier living environments."

BACKGROUND

Introduction

DPR Korea (population 24 million) [1] is mountainous, and up to 65% of the population is urbanized. There is a centralized model of state governance, with the country being administratively divided into 10 provinces, 1 major municipality and 210 counties. The country is further sub-divided into smaller administrative units known as Ri (in rural areas) and Dong (in urban areas).[2] Rapid urbanization took place in the early 1950s as a result of the policy of industrialization after the Korean war (1950-1953). In rural areas, populations are clustered into semi-urban settlements based around cooperative farms and work teams.[3] There is a wide variety in population density between provinces, as a result of the fact that populations tend to be concentrated in the lowland provinces.

DPRK has been confronted with significant socio-economic and environmental impacts in recent years which have had impacts on health service quality and on public health. There were severe economic impacts on the social system in the 1990s due to loss of subsidies and introduction of economic sanctions, leading to a sharp decline in national income. Per capita incomes halved in this time (from $991 in 1993 to $457 in 1998).[4] This economic situation was exacerbated by extreme weather events in the same period, leading to the first documented cases of food shortages. This has severe impacts on the health of women and children in particular. From 1993 to 1998, the infant mortality rate increased from 14 to 23 per 1,000 live births and the under-five mortality rate from 27 to 55 per 1,000 live births.[5]

From the early 2000s, the economic situation began to stabilize. However, the state of the economy continues to be challenged by international barriers to trade and commerce and WFP reports continuing shortages of adequate food supplies for a significant minority of the population. The food and agricultural production has consistently demonstrated deficits of some 30 per cent compared to 1994,[6] resulting in partial dependence on food aid for a minority of citizens. Between the crisis years of 1993 to 1999, life expectancy was reported to have declined from 73.2 years to 66.86 years.[7] GDP was in decline in the 1990s. Gross national incomes have recovered however from $464 in 1997 to $564 in 2004, and to $638 in 2007.[8] There was 7.8% annual growth in GDP between 2004 and 2007. More recently, food insecurity has been attributed to such factors as low output of the farming sector, long-term decline in soil fertility, shortages of inputs, extreme weather events, and internal constraints on market activities. [9] Only 142 kg will be available on average per person from domestic production, compared to an estimated 167 kg needed for a healthy diet. As a result of these factors, around 40 percent of the population (8.7 million people) was classified by the World Food program and Food and Agriculture Organization in 2008 as requiring urgent assistance. [10]

Demography

In the period between 2000 and 2005, the birth rate decreased to 17.5 per 1,000 population to 14.9. The crude death rate remained at from 8.8 per 1,000 population between 2000 and 2005. The total fertility rate remained in 2.01-2.0 level in the same period despite the decrease in the crude birth rate. This is explained by the lower proportion of reproductive aged women in the total population. The reproductive aged woman proportion in total population was 29.7% in 1999 and 26.6% in 2005. In addition to the above factors, the combination of low birth rates and high death rates has resulted in a gradual decrease in the population growth rate.[11]

The overall development goal of the Government of DPRK is to restore the quality of life of people to the highest level achieved before economic and humanitarian difficulties in the mid 1990s, and sustain continuous development. DPRKs focused areas include improving the quality of life of people (MDG 1), social development (MDG 2,4,5,6) and sustainable development of the environment (MDG 1, 8) and developments in science and technology

Table 1 Demographic Indicators DPRK

Basic Indicators	Census 2010
Average life expectancy at birth	69.3 years
Male life expectancy at birth	65.6 years
Female life expectancy at birth	72.7 years
Crude birth rate	14.4 per 1000
Crude death rate	9.0 per 1000
National population growth rate	0.54%
Total fertility rate	2.00 per woman
Population under 5 years	7.1%
Population under 15 years	23.2%
Population 60 years and over	13.1%
Urban population	61%

Priorities include ensuring sustainable food security, safe water supply and sanitation systems, disease prevention and improvements to health care services and infrastructure and compliance to international agreements including climate change.[12]

The most recent census data indicates that life expectancy is 69.3 (72.7 for females and 65.6 for males). Crude birth rate is 14.9 per 1000 population, and the total fertility rate per woman, 2.03. 13.1% of the population is aged over 60 years, with the WHO CCS concluding that DPRK has the oldest age structure in the region.

The pattern of demographic for children is similar to that of China and Thailand. Whilst the DPRK's under-five population in 2003 was 7.1 per cent of the total, that of China was 7.1 per cent and that of Thailand 8.4 per cent, considerably less than for a least-developed country, such as Cambodia (14.6 per cent).[13] Main demographic and economic indicators are outlined in table 1, with sources of data from the MOPH (2006) and WHO 2008 statistics report and 2010 Census (CBS).

The Resource Commitment of the Government of DPR Korea to Primary Health Care

The commitment of the Government of DPR Korea to the development and maintenance of the primary health care system has been substantial. Since its establishment in the 1980s, the health system workforce has developed into 215,727 staff of all categories. In Asia, DPR Korea has the second highest professional health staff to population ratios.

Categories of Health Staff are included in the table below.

Table 2 Categories and Numbers of Health Staff in DPR Korea [14]

Category	Ratio	Numbers	% Workforce
Doctors	3.2/1000	76,135	35.29
Nurses	3.8/1000	91,200	42.28
Pharmacists	.3/1000	7365	3.41
Midwives	.3/1000	7200	3.34
Other Health personnel	1.4/1000	33,827	15.68
TOTAL		215,727	100

It is not only in terms of operational costs and salaries for health staff that additional finance is required. Substantial resources are also invested into the pre service education and continuing education programs of this health workforce. For this purpose, there is a Medical University based in each province to provide pre service training.

The health sector is also tasked with financing the extensive network of 8945 health facilities across the country. These facilities require equipping, logistical support, renovation and maintenance and operational support.

Table 3 Categories and Numbers of Health facilities in DPR Korea [15]

Health Facilities DPR Korea	No	%
Central and Provincial Hospitals	133	1
Anti Epidemic Institutes	227	3
Preventive Institutes	65	1
Sanatoriums	682	8
County and Ri Hospitals	1575	18
Ri Clinics and Polyclinics	6263	70
TOTAL	8945	100

The annual commitment to financing for the health sector is estimated at $900 million per annum, according to the following broad cost categories in the table below.

Table 4 Cost Categories Government Financing of the Health Sector [16]

Cost Category	%
Human Resources (Salaries)	
Human resources (Pre service Training)	
Rehabilitation and Renovation	
Equipment and Logistics	
Other Operational Costs	

The Government of DPR Korea has committed to raising the share of GDP investment from 5.9% in 2010 to 7% in 2015. Additionally, the MOPH commits in the MTSP to substantially increasing midwife to population ration from .3/1000 to .4/1000, and nursing numbers from 3.8 to 4.8/1000 in order to establish a more balanced mix of health workforce skills at the primary level of care. This will result in an increase of 31,865 in the size of the health workforce by 2015.

The Process of Plan Development

The following steps outline the process of health sector plan development in DPR Korea.

1. In 2006, the concept was put forward by the MOPH for development of health sector plan as part of a health system strengthening proposal (funded through GAVI).

2. In 2009, as part of the development of the MOPH WHO Country Cooperation Strategy, development of a health sector plan was agreed as one of the priorities for WHO's cooperation with the Government of DPR Korea.

3. Following consultations between the Vice Minister for Health and WHO in November 2009, the agreement was then reached to develop a "Medium Term Strategic Plan for the Development of the Health Sector in DPR Korea 2010 – 2015."

4. A road map for development of the plan was then developed which proposed a plan development period between November 2009 and June 2010 with key steps involving situation analysis, objective and activity setting, establishing a monitoring and evaluation strategy and costing and financing. National consultative workshops were undertaken with the senior management and development partners on three occasions between November 2009 and April 2010, focusing on health system strengthening, the social and environmental determinants of health and plan appraisal.

5. A situation analysis document, using data from the national consultations and documentary sources, was circulated to the MOPH and development partners in December 2009 for additional inputs.

6. A guideline was developed for MOPH program inputs to the development of priority activities. This was circulated through the MOPH and these results were then included into the plan.

7. Five working groups were established for each strategic area, and successive meetings were undertaken in March 2009 with each group to identify priority activities and strategic approach.

8. The WHO Guideline on Monitoring and Evaluation frameworks was applied to develop a national M & E framework. Sources of data for the framework included the national Census, multi cluster surveys of UNICEF, baseline surveys for Women's and Children's Health and MOPH health information data. A workshop was conducted at the central level in March 2010 with Departmental Heads and program managers to identify indicators, baselines and targets.

9. Costing by strategic area was undertaken using a planning and costing template. A combination of central level estimates and bottom up costing methods was applied to identify costs and sources of finance for each priority activity. Workshops with each strategic area group were conducted to validate cost estimates.

10. On April 5, the draft plan was then circulated for additional comments to the MOPH and development partners, and the next draft was then presented at the joint MOPH and Development partner meeting on April 8 2010.

11. At this consultative meeting, priorities for the first three areas were identified for each strategic area, along with setting of targets for geographic coverage (numbers of provinces, counties etc for scale up)

12. A financing meeting was conducted with development partners in April 2010 in order to identify financial commitments and sources of finance for the medium term.

13. Between April 15 and June, the plan was disseminated to all MOPH department and programs, provinces and development partners for a final round of consultations and plan adjustments, prior to the launch of the plan in June 2010.

STRATEGIC PLAN

VISION, VALUES AND STRATEGIC FRAMEWORK

Health Sector Vision and Values

Vision: *By 2015, there will be improved health of the population through enhanced access to higher quality health care services and healthier living environments*

Values: *Quality, Accessibility, Equity, Efficiency, Effectiveness*

National Consultative Workshop December 2009

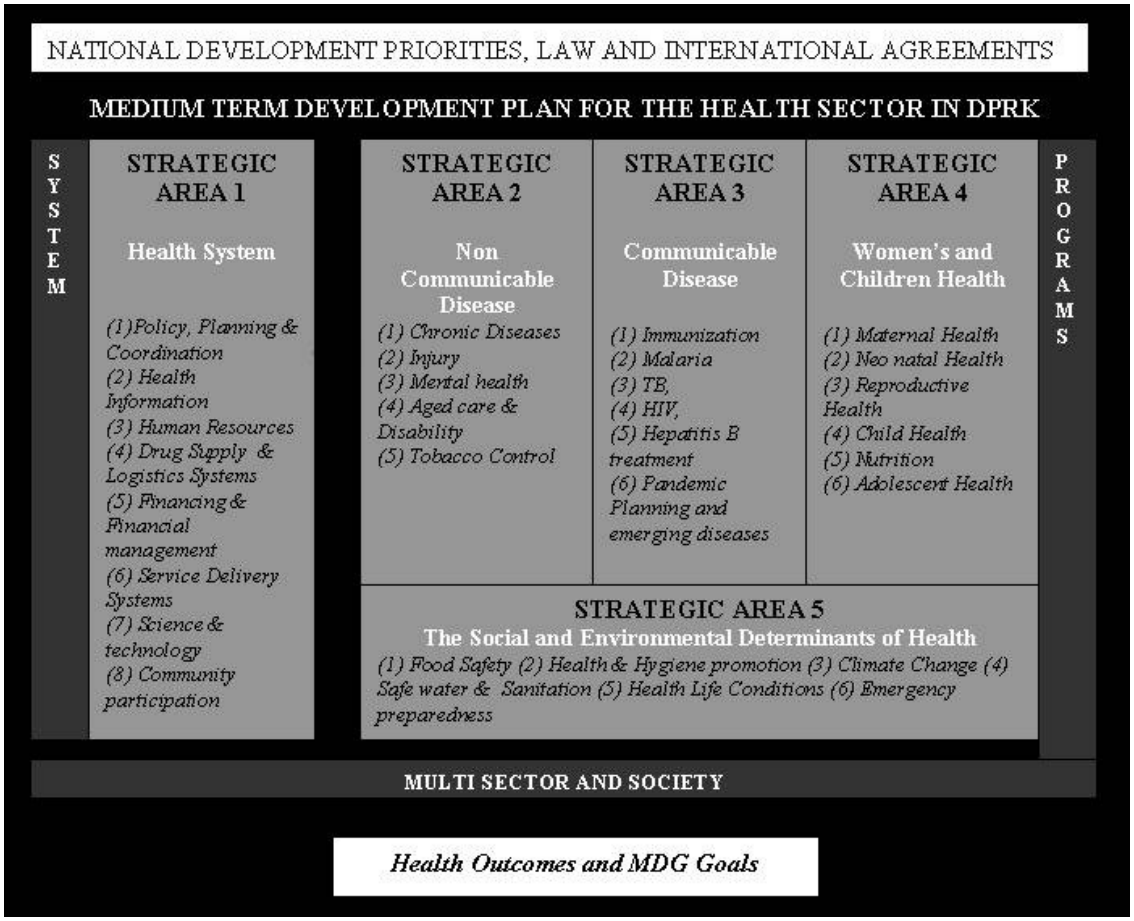
National Health Priorities

National Health Priorities

1. *Decrease burden of communicable diseases*
2. *Delivery of quality medical services*
3. *Strengthen Household Doctor system*
4. *Protect and promote maternal, child and elderly health.*
5. *Strengthen prevention and control of major NCD and risk factors*
6. *Provide sufficient medicines (essential medicines and OTC medicines)*
7. *Strengthen Human Resources for Health*
8. *Integrated health management information system.*
9. *Strengthen emergency preparedness*
10. *Intensify international cooperation and partnership*

National Consultative Workshop MOPH December 2009

Strategic Framework



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Supported by WHO, UN agencies, Development partners EUPS, multilateral agencies

STRATEGIC AREA 1 HEALTH SYSTEMS

STRATEGIC AREA OBJECTIVE

The overall objective of the health system strengthening strategy is to improve the effectiveness, quality and accessibility of health care to improve the health status of people.

Situation Analysis Health Systems

International Background for Health Systems Development

In the 2008 World Health Report, WHO outlined recent setbacks in the attainment of health equity goals as expressed in the primary health care vision from the 1980s. The setbacks are attributed to three major characteristics of modern health systems. These are (1) a disproportionate focus on specialist and tertiary care (often referred to as "hospital-centrism"), (2) fragmentation as a result of the multiplication of programmes and projects and finally, (3) commercialization of health care in unregulated health care systems.

A second development has been the emergence of the health system strengthening concept. WHO describes health systems in terms of fundamental building blocks inclusive of such categories as human resource management, health workforce, service delivery, and finance and drugs and logistics systems.[17] This means there is a "systematic" challenge of strengthening these building blocks for disease prevention and control, rather than focusing solely on the traditional "programmatic" response characterized by program investments such as immunization, TB, malaria and HIV AIDS prevention and control. The World Health Assembly resolutions on the social determinants of health in 2008 also encourage WHO member states to provide more technical focus on measures and interventions for addressing inequities in access to health care. [18]

Internationally, there is a trend towards financing of health development through Global Health Initiatives such as GAVI and the Global Fund. GAVI, the Global Fund and the World Bank are putting in place a "common platform" for financing of health system strengthening in coming years. The focal point for financing of such an initiative will be through analysis of gaps in financing of multi year health sector plans.

The International Health partnership has been recently formed to facilitate more coordinated health partnerships, with national health sector plans and monitoring and evaluation frameworks once again being the focal point for the plans. The overall purpose of the International Health Partnership (IHP) is to scale-up in a coordinated fashion coverage and use of health services in order to reach health-related millennium development goals.[19] The two IHP countries in the region are Nepal and Cambodia. The IHP has developed a management tool by which to assess the quality of a multi year health sector plan.[20] Measures of quality of a health sector plan include: [21]

- The situation analysis, and coherence of strategies and plans with this analysis
- The process through which national plans and strategies have been developed
- Financing and auditing arrangements
- Implementation and management arrangements
- Results, monitoring, review mechanisms
- Alignment with national development frameworks, multi-sectoral strategies and disease specific strategies

From an epidemiological standpoint, the global influenza pandemic in 2009 and the developing evidence of the health effects of global warming point to the need for strengthened international cooperation and partnership for adaptation to environmental

and epidemiological change through international cooperation. Revised international health regulations require all countries by 2012 to have core capacity for disease surveillance, reporting, notification, verification, response and collaboration activities.[22] There are therefore 4 key areas where international health developments will impact patterns of international collaboration with DPRK. These are (a) pandemic preparedness and response and CDC prevention and control as outlined in the International Health Regulations (b) adaptation planning for management of the health effects of climate change (c) increased focus on measures of health equity (social determinants of health) (d) health system strengthening, in particular for maternal and child health.

SYSTEM AREA 1 Policy, Planning and Coordination

The Governments policy objective in the 1950s and 60s was to rapidly expand the national network of health care services. In the 1970s, the main policy objective shifted to extension of health services to remote areas and reductions in health inequalities, with universal coverage being attained in the 1980s. Universal and free health care is guaranteed in the country's Constitution of 1960 and the Public Health Law of 1980.

Figure 2 Public Health Achievements DPRK

DPRK Public Health Achievements

- Increases in immunization coverage of DPT3 from 38% in 1998 to 92% in 2008 (UNICEF and WHO);
- Poliomyelitis eradicated with last polio case in 1996 (WHO and UNICEF); iii)
- Phased five-year expansion of the TB control program using the DOTS strategy covering the whole country from end 200385% reduction in annual number of malaria cases since the peak of 300,000 in 2001
- Nationwide expansion of the TB DOTS strategy. In 1998 DOTS was introduced and by 2003 all 213 counties in the country were covered
- Maintenance of 95% Vitamin A coverage
- Introduction of Hepatitis B vaccination into the routine immunization program since 2003
- Improved equipment provision and blood bank services to hospital facilities through international partnerships[1]
- As reported by an independent evaluation, rapid scale up of Integrated management of Childhood illness strategy, with associated increase in quality and coverage of child sickness care
- Successful management innovations through development of multi year plan for TB, Malaria, Reproductive Health and Immunization, and strengthened international collaborations for health system strengthening through UN agencies, bilateral agencies, NGOs, the Global Fund and GAVI.

The Public Health Law particularly emphasizes commitment to a health care system that is equally preventative and curative and gives special priority to the needs of women and children. Laws cover such areas as bringing up and education of children, prevention of infectious diseases, drug Management and environmental protection:[23] Gender equality is a priority policy in DPRK, and the country has acceded to the following human rights instruments: i) International Covenant on Economic, Social and Cultural Rights (ICESCR) - 1981; ii) International Covenant on Civil and Political Rights - 1981; iii) Convention on the Rights of the Child - 1990; and iv) Convention on the Elimination of All Forms of Discrimination against Women - 2001. [24]

In more specific terms in relation to health policy, the DPRK Government aims to promote universal access to free health care and coverage on the basis of need. The goal set in PHC development strategy is for DPRK "to protect and promote the lives and health of people with the equitable provision of basic, essential and quality health services to entire population, focusing on prevention and health promotion". Other important principles in health policy include community participation, inter-sectoral action for health and commitment to health equity. [25] Despite severe resource constraints particularly since the early 1990s, important public health achievements have been achieved in DPRK in recent years. These are included in the figure below. However, the WHO CCS indicates persistent priority health issues that include high maternal mortality and rates of abortion, high prevalence of low birth weight and childhood malnutrition; TB, malaria and Hepatitis B.[26]

The table below provides a summary of main health indicators for DPRK, contrasting national with regional averages (SEARO).

Table 5 Selected Health Indicators DPRK [27]

Health Indicators	DPRK	SEARO region
Maternal Mortality rate	85/100,000 (Census)	450/100,000
Under 5 mortality rate	26.7/1000	65/1000
Delivery by Skilled Birth Attendant	97%	48%
Contraceptive Prevalence rate	67.2%	57.2
Malaria mortality rate per 100,000	0	2
TB treatment Success Rate	86%	87%

The various resources gaps and constraints in the health sector may seem overwhelming, but a lot of progress has been made in recent years in addressing these gaps, particularly through more sustained partnerships of international and national cooperation. These developments include the following:

- The proposal to develop a multi year health sector plan which should identify and specify clearly resource gaps and investment opportunities (GAVI HSS and WHO Country Cooperation Strategy)
- Strengthened international partnerships through Global Health Initiative investments (GAVI and the Global Fund) and UN and NGO partnerships (both national and international)
- Multilateral programs through MOPH and WHO to rebuild the health care infrastructure for women's and children's health

- The strong network of household doctor system and existence of community based groups such as the peoples' committees, trade unions, women's association, youth league and the Korean Elderly Association

Major international cooperation partnerships include the following:

GAVI: The goal of the GAVI supported program of health system strengthening (HSS) support is to promote sustainable gains in immunization coverage through targeted investments in health systems strengthening. The strategic focus of this program of assistance is on strengthening health management and service delivery systems at the implementing agency levels of *county* (district) and *ri* (PHC). The two overarching components of the GAVI HSS program are (1) system development and capacity building for health management and (2) support for service delivery at *county* and *ri* level (co-financed with MOPH and GAVI partners WHO & UNICEF). The program is valued at $4.32 million US over 3 years (2008 – 2011) and is closely linked to the GAVI Health System Strengthening program. [28]

GLOBAL FUND: Two recent awards have been provided to DPRK, with commencement of programs expected in 2010 and extending to 2014. The program for malaria prevention and control (valued at $18,348,551) will aims for the "the pre-elimination of malaria in the Democratic Peoples Republic of Korea through an expanded and comprehensive approach to malaria control programming." [29] The overall goals area to (1) To reduce overall malaria morbidity by 50% of the level in 2007 (Incidence 0.62 per 1000 people) by 2013 and (2) to reduce malaria morbidity in the higher transmission zone by 70% of the level in 2007 (Incidence 2.4 per 1000 people) by 2013.The program for tuberculosis prevention and control 2009 – 2014 (valued at $47,102,402) has 5 component areas including :(1) Improving the quality of DOTS (2) establishing partnerships with other sectors (3) Improving advocacy, communication and social mobilization (4) Developing and implementing interventions for the management of MDR-TB, and (5) Contributing to health systems strengthening.

The MOPH, in collaboration with WHO has initiated a *Women's and Children's Health project* in counties across the country. This wider program of HSS for MCH, which commenced in 2006, [30] has now been extended 2008 – 2010. The main areas of focus include: (a) an improvement in the standards for health care and public health in DPR Korea, with a particular focus on the needs of women and children, (b) retraining of health professionals, (c) improvements in the functioning of county hospitals and ri clinics including safe deliveries, obstetric and surgical services, care of the new born, handling of severe diseases in childhood and safer use of blood, and (d) an improved health management capacity including an integrated information system to permit the proper monitoring of women's and children's health services and their impact.[31]

UNFPA supports the Government to improve the reproductive health status of men and women in four provinces through supply of essential drugs, contraceptives and equipment to ri clinics and county hospitals, capacity building of services providers on EmOC and new born care, and distribution of public education materials in order to increase reproductive health information and knowledge among the population. Since 2008, UNFPA has supported the Government for national wide provision and utilization of life saving reproductive health drugs namely oxytocin and magnesium sulphate, which was one of the effective interventions for reduction of maternal mortality. UNFPA also provided

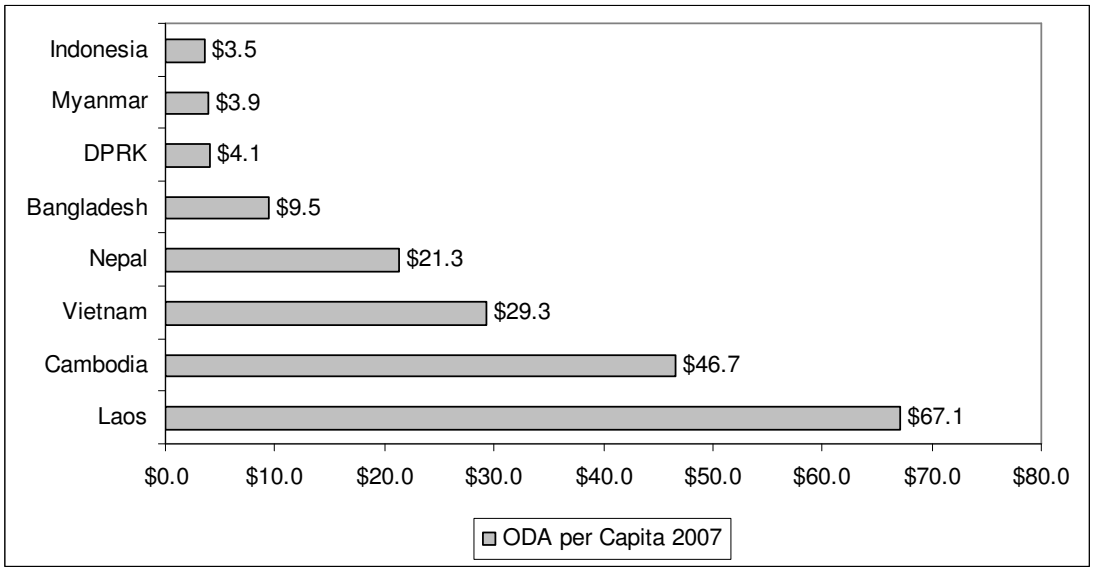
emergency reproductive health kits to the effected counties and Ris during the natural disasters happened in the country,[32] *UNICEF* supports the provision of immunization of infants and pregnant women nationwide, including the elimination of neonatal tetanus. The maternal and child health project operates mostly in the 10 focus counties. UNICEF also supports national child health days for vitamin A supplementation and de-worming of young children. All of this is underpinned by the continuing support for the provision and distribution of essential medicines, especially for illnesses such as diarrhea and pneumonia in children. [33]

WHO recently produced a draft Country Cooperation Strategy with the Government of DPRK. This comprises 5 strategic areas of (1) strengthening the health system to further develop capacity for policy and planning; and improve service delivery (2) address women's and children's health, (3) communicable disease prevention and control (4) addressing the risk factors leading to increasing prevalence of non-communicable disease (5) addressing the environmental determinants of health, such as flood and drought, water quality and pollution, food safety and hospital waste management.

In terms of international health assistance, DPRK so far has had no assistance from international finance institutions such as World Bank, IMF, Asia Development Bank. The only Global Health Initiative active in the country is GAVI, although recently, grants have been awarded for TB and malaria for prevention and control through the Global Fund.

The impact of international relations on DPRK health assistance is further evidenced by the figures on aid flows published by the Organization for Economic Cooperation and Development (OECD). These figures demonstrate that on a per capita basis, DPRK is at the lowest end of the spectrum of support in terms of foreign aid flows. There is as little as $2 to $3 per capita support from international assistance agencies, sharply contrasting with comparable GNI nations in the Asian region. Moreover, 78% of the aid is categorized as "emergency assistance."

Figure 3 Overseas Development Assistance per Capita Asia Region [34]



This very large inequity in international development assistance in the region provides some insight into the comparative disadvantage of DPRK in the financing of the re development and continuing operations of the health sector.

Although as noted above overall per capita development assistance to DPRK is very low on a regional basis (see figure above), health development assistance, relative to government expenditures, has increased over recent years. This reflects the ongoing importance of international partnerships as well providing a strong rationale for development of a sector wide planning process in order to maximize the opportunities presented by development partnerships.

SYSTEM AREA 2 Health Management Information Systems

As outlined earlier, DPRK has a centralized system of health management. The advantage of this system is that it provides significant coverage across the country, principally through the section doctor system and network of clinics, hospitals and anti epidemic stations at each level of the system. However, some of the potential disadvantages of central planning is that there can be over reliance on centralized decision making which can have consequences for local level data collection, analysis and use of information for local area decision making. There is an absence of age disaggregated infant mortality data and at county level and below, there is little or no desegregations of data based on age, place or gender. This limits management and planning capacity to identify high risk areas and take corrective action. [35] There is undoubtedly a need for strengthening of health system research capacity. Currently, there is currently no overall multi year health sector plan. However, in recent years, many national programs have developed multi year plans that have been costed. This includes immunization, TB, malaria and reproductive health.

Figure 4 Health System Barriers and Gaps - Planning, Management and HMIS

Health System Barriers and Gaps - Planning, Management and HMIS

- Lack of linkage between information, planning and management
- Weak capacity of planning with strategic view in line with global standard and country specific context
- Pursuance of sectoral health information systems leading to formation of fragmented and vertical information systems
- Unavailability of a master plan for integration of health information system.
- Lack of knowledge of Public health management and information technology among planners and managers.
- Uncoordinated planning in terms of financial and material support

As part of the health system analysis for development of the GAVI health system strengthening strategy in 2006, barriers to effective management and planning were identified by respondents. These include insufficient management integration between MCH, IMCI and immunization management, delays in outbreak response, and limitations in epidemiological analysis by sub national managers. Several sources report that data is often lacking in terms of accuracy and completeness. This limits management and planning capacity to identify high risk areas and take corrective action. [36] Efforts to improve existing systems have had limited success due to lack of evidence based planning. [37] As in many other countries, the GAVI HSS proposal noted the fragmentation

of health planning along vertical program lines, and the need to strengthen health micro-planning and management skills of health staff, particularly at the county level. [38] Sub national managers in the DPRK health system have expressed the need during an independent evaluation to improve provincial and country level skills in management, planning and epidemiology.

Proposals for management strengthening in the HSS strategy [39] include development of process for multi year health sector planning and strengthening of decentralized management and planning capacity, and a reform of the health management information system. These strategies are intended to reduce vertical program fragmentation and improve in particular outbreak response and program reach.

SYSTEM AREA 3 Human Resource Development

Many sources in this review note two dominant characteristics of health human resource management in DPRK. These are: (1) The significant opportunity presented by the excellent resourcing of the sector with medically trained professionals extending to the primary level of care through the section doctor system and (2) The missed opportunity for higher quality care resulting lack of sufficient opportunity for exchange to the latest developments in public health and health technologies.

In terms of *human resource numbers and distribution*, DPRK has one of the highest ratios health workers to population in the region and this workforce is distributed on a population basis. By the end of 2006, the number of doctors was 76,135, with 44,760 in the section doctor category.[40] There were also 7,365 pharmacists.

In terms of the mix of skills of human resources, doctors comprise 41.9% of the health workforce, and nurses 50.14%. Although the ratio of midwives to population (.3/1000) is low on a regional and global average, the Human Resource Plan notes that the continuum of MCH care is maintained by the high overall health worker population ratio.

DPRK has in place strong systems for pre-service and in-service training. However, the HR Plan notes that training institutions and their staff are under resourced and there is a focus on knowledge acquisition rather than skills acquisition or competency. Additionally, and as outlined earlier, information sources are limited and there is limited opportunity for peer exchange internally or internationally.

Figure 5 Health System Barriers and Gaps – Human Resource Management

Health System Barriers and Gaps – Human Resource Management

- Lack of educational equipment/supplies in pre and in-service education institutions along with poor educational capabilities of the teachers
- Inadequate number of nurses in the health settings
- Inadequate number of house hold doctors in the primary health settings in some locations
- Non-availability of tools for the evaluation/examination on the knowledge and skills of the health workers in a qualitative/quantitative manner

The Medium Term Human Resource Development Plan [41] identifies three strategic areas for human resource improvement in DPRK including: *(1) Human Resource Planning* (HMIS, functional analysis of the health system and improvements to HR data bases), *(2) Human Resource Management*, in particular strengthening supportive supervision measures, instituting quality assurance programs at the ri level (primary level) and increasing the capacity for operational research) and *(3) Health Worker Training*, with expected outputs including the review of pre-service curriculum to reflect international trends towards an integrated preclinical and clinical medical education, a change to competency based training and assessment for in-service training programs, and a plan to develop public health management through a national MPH program (or equivalent) and finally, a modular middle management training package for county level health managers.

SYSTEM AREA 4 Financing and Financial management

Government revenues are not derived from taxation but through the trading of state and cooperative assets, such as agricultural and industrial products and services. The ownership of these assets is divided among the central government, local people's committees and workers' and peasants' cooperatives. However, as a result of the economic decline in the 1990s, the revenues may have fallen to levels below those needed for the maintenance of essential services. [42]

The DPRK health system is almost entirely publicly funded. Latest data from WHO National Health Accounts in Geneva reflects high investment by government relative to total investment in the sector, relatively low private expenditures on health, and relatively high external resources for the health sector, relative to total government investment in health (i.e. in absolute terms, external assistance to the sector is very low on a comparative per capita basis).

Table 6 Data on National Health Accounts DPRK [43]

Health Financing Indicators DPRK	
Total expenditure on health as % of Gross domestic product	5.9 %
General government expenditure on health as % of total govt. expenditure	6%
External resources for health as % of total expenditure on health	49.60%

Government data on national health accounts indicates that in 2005 the expenditure on health was 6.44% of the state budget.[44] There is no data available on private expenditures on health, but it is expected to be very low.

In terms of financial management, funds flow from the Ministry of Finance to the Ministry of Public Health (MoPH) every year, as decided by Supreme People's Assembly. The MoPH then allocates funds to the provinces, after which provinces allocate to the cities and counties. Funds to provinces and cites / counties flow on a monthly basis to a network of national (central, province and county) banks. Salaries and other costs are paid by the institutes through the funds that flow to local banks. [45]

Figure 6 Health System Barriers and Gaps – Finance and Financial Management

Health System Barriers and Gaps – Finance and Financial Management

- Due to economic difficulties of the country, the government expenditure for public health is not meeting the actual health needs.(GNP-based health financing)
- Some mismatches of the actual health needs and the international support, shrinking and reluctance of the donors in health sector
- Investment is not enough for accommodating the fast-developing science & technology.
- Related sectors like chemical & pharmaceutical industry are not supportive enough for health services provision (due to economic difficulties)

The contraction in the national economy in the 1990s described earlier has resulted in serious financial constraints for the functioning of the health sector, particularly in terms of energy supply and hospital and medical supplies. [46] The National Immunization program notes that there is insufficiency of finance for transportation of vaccines and maintenance of the cold chain. Logistical weaknesses include lack of transport capital and financing of operational costs. This affects service delivery as well as the operation of the waste management system. [47] Malaria, TB and reproductive health programs all note in their strategic plans the widespread difficulties with reach and coverage of financing for logistics, essential medicines, supervision and supplies and transport. Constrained finances have resulted in interrupted electricity, water supply to facilities. Mobility of health staff for supervision have been limited to that possible through WHO funding. [48]

There is no overall financing profile for the health sector. However, it is important to note that national programs such as TB, malaria and immunization have developed multi year plans that identify major cost categories, source of finance and finance gaps. The ability of planners to research and identify costs and financial gaps has no doubt been a critical factor in mobilizing national and international resources, and is an important lesson learned in particular for maternal and child health programming and resourcing.

SYSTEM AREA 5 Essential medicines and Logistics

The recent public health successes in DPRK in relation to prevention and control of TB, malaria and vaccine preventable disease demonstrates how adequate equipping of essential medicines, supplies, vaccines and logistical support can result in rapid impacts on expansion of health service coverage.

The production, storage, use and management of medicines are controlled by the law based on the “Medicine management law, DPRK”. About 270 items are registered as the essential medicines and used in all health institutions. WHO identifies 40 essential medicines that should be used at PHC level. The state places a high priority on the local production of essential medicines, preventive medicines, traditional drugs and takes measures to increase the varieties and quantities of medicines.[49]

The evaluation of the women's and children's health project noted the impact on services coverage and quality of adequate equipping of facilities for maternal and child health care. As the quote from the evaluation demonstrates, adequate resourcing of the sector with essential medicines, supplies and mechanism for referral can have immediate effects on maternal and child survival -

> "At the Country level hospitals that have been supported by the WCHP project there was a clear message from all staff interviewed. There is an improvement in the quality of services. Patients feel safer and more secure. There are reductions in post-operative infections, in mortality rates, and response time for emergency call outs. Laboratory diagnostics have improved as has the ability of doctors to correctly diagnose and manage cases, This has led to a decrease in referrals to higher levels." [50]

UNFPA is supporting the central and provincial medical warehouses to strengthen management of reproductive health commodities through technical assistance, capacity building of staff on logistics management, establishing a computerized database for record keeping, reporting and for management use at provincial and central level, and improving regular monitoring of the system. Initially UNFPA supported three provincial warehouses to establish and improve the Korean Logistical Management and Information System (KLMIS) and recently it has been scaling up national wide.

Nevertheless, in locations where health system support is lacking, "the quality of health care provided in ri clinics and county hospitals is reported to be low. This is due to the poor condition of the infrastructures including availability of water, sanitation and electricity, lack of essential medical equipment, supplies and the health professionals' limited knowledge and skills in relation to best international practice." [51]

Many reports record the problem of chronic shortages of medicines and supplies at all levels of the system. [52] In 2003, it was reported that 70% of essential medicines to clinics and hospitals outside of the capital are being provided by international organizations, in particular UNICEF and the International Federation of the Red Cross (IFRC). [53] In 2006 it was reported that UNICEF provided essential medicines, targeted especially for women and children, to health institutions covering 55 per cent of the country's total population.[54] A Reproductive Health Survey conducted in 2004 indicated that 85% of induced abortions could be addressed through the adequate provision of family planning resources, indicating that shortages of equipment and supplies rather than education are the main reasons for non uptake of family planning services. [55] UNICEF reports that the quality of emergency obstetric care is limited by lack of accessibility to transfusion and surgical services at the country hospitals, where most of these emergencies should be managed (1st level of referral). [56] The independent evaluation conducted in 2007 observed that there was consistent reporting of about 30% stock out in the last three months in most of the facilities visited for pediatric drugs, and that the unmet need for emergency obstetric drugs was reported to be even higher (up to 50%).[57] The HIV strategic plan notes the difficulty with implementation of safe blood policy in the absence of infrastructure for safe blood transfusion at many facilities.

It has also been reported during the consultation for this analysis that (a) poor drug management practice exists at the county hospital and Ri clinics, particularly in relation to keeping expired drugs at the service level , and (b) there is a lack of adequate tools for monitoring drug and commodity supply at the facility level.

Figure 7 Health System Barriers and Gaps – Logistics and Essential medicines

Health System Barriers and Gaps – Logistics and Essential medicines

- Challenges in logistics); inadequate supply of medical equipments and consumables especially in County and Li level), inadequate storage capacity and lack of transportation means and fuel
- Essential medicine ; lack of raw material, modernization of local pharmaceutical production in compliance with GMP, inadaquate quality control (NRA and NCL)
- Traditional Medicine; lack of technical competence for evidence based
- Diagnostic and treatment practice in TM, lack of knowledge and technology exchange
- Science and Technology; not timely Introduction of recently developed medical technology and science, (telemedicine), lack of materials and equipment for education, lack of collaboration in Science and technology

In DPR Korea, traditional medicine and Koryo medicine are widely practiced nationally. Treatment coverage by traditional medicine at different levels of the health system has been reported to be approximately 30–40% at the central level, 40-60% at the city/county levels and 70% at the peripheral level.[58] The national consultative meeting on health system analysis on Pyongyang in December 2009 highlighted the need for integration of traditional and modern medicine using evidence based approaches.

SYSTEM AREA 6 Service Delivery Systems

DPRK has an extensive infrastructure of 130 hospitals at central and provincial levels, 1701 hospitals at county level and Ri levels, 5895 Ri clinics and poly clinics. There is one hygiene and anti epidemic health station at central level, and one for each of the 10 provinces and 206 counties.[59] Their function is surveillance of communicable diseases, outbreak response and water quality monitoring. County hospitals provide secondary specialized care. Ri clinics are staffed by 10-15 household doctors and offer a range of essential medical and outreach services. Ri hospitals in rural areas have specialist departments including obstetrics, gynaecology, traditional koryo medicine, dentistry, surgery and medicine (urban poly clinics have a similar function). [60] There is a very high delivery rate of infants by trained medical staff (96.7%) and most births take place in ri hospitals and clinics and county hospitals. Overall, health system facilities are run by 215,727 health staff. The DPRK Health System is based on the "household doctor" system. This system provides integrated first line preventive and curative services through placement of 1 section doctor for every 130 households. There are 44,760 of these household doctors in DPRK, all of whom are medically trained.[61] The ratio of 8.98 health workers per 1000 population is one of the highest in the region, and demonstrates the very high level of resource commitment of the Government of DPR Korea to the principles of primary health care.[62]

In addition to the provision of the range of modern medical care at each level of the system, traditional medicine is also widely practiced, especially at the PHC level.

Figure 8 Health System Barriers and Gaps – Service Delivery Systems

Health System Barriers and Gaps – Service Delivery Systems

- Poor Capacity for health system performance due to -
- Lack of updated skills of health professionals and equipment for rapid diagnosis and treatment
- Lack of sharing medical technology
- Lack of transportation for referral
- Health facilities outdated for health performance

In terms of infrastructure, there is increasingly difficult access to energy supplies. Hospitals and clinics are affected by electricity, water and heating problems. [63] In rural areas in the winter months, temperatures can drop to – 20 C. Mobility of health staff and transportation of vaccines is constrained by limited access to transport. Less than 60% of counties have motorcycles.[64] The central level of the National TB program and most provincial, district and county level hospitals suffer from insufficient or poorly functioning infrastructure, basic equipment, transport, communications and storage facilities, and shortages mainly of diagnostics and other consumables. [65] A recent baseline survey for the Women's and Children's Health Project noted the poor physical capacity of health facilities at all levels, but particularly county and ri (in areas where the project has not yet been implemented). The majority of facilities were found to have medium or low capacity in terms of equipment. In particular, equipment at ri clinics was weak, as was laboratory and blood transfusion equipment at county hospitals. [66] A "bottleneck analysis conducted by the Government of DPRK in collaboration with UNICEF and development partners noted similar gaps in health systems development. [67]

In response to these problems, the MOPH has recently developed a Safe Blood Policy, and is proposing to scale up implementation of the Women's and Children Health Project.

Seven system areas have been identified by the MOPH for health system strengthening and include the following:.

1. Policy, Planning & Coordination
2. Health Information
3. Human Resources
4. (Drug Supply & Logistics Systems
5. (Financing & Financial management
6. Service Delivery Systems
7. Science & technology
8. Community participation

Strategic Plan Health Systems

System Area 1 Planning and Coordination

Sub Objective & Strategic Approach

- **Sub Objective:** To improve the M&E of health system through capacity strengthening of health planners and managers and to improve the cooperation and partnership with external parties for better resource mobilization

- **Strategic Approach:** Improving resource mobilization for health through strengthened planning and management capacity and international collaborations

Priority actions

1. Mobilize additional international resources for health through development of a multi year health sector plan
2. Undertake financial analysis to identify priority resource gaps in the health sector
3. Strengthen and implement international cooperation agreements with UN and international agencies
4. Establish a sector wide health forum of government and international agencies to enable effective coordination of international resources for health
5. To develop the manual and guidelines for capacity strengthening of health managers, planners and supervisors.

System Area 2 Health Information System

Sub Objective & Strategic Approach

- **Sub Objective:** To establish and strengthen the integrated health information system to provide accurate and timely information for evidence-based public health planning

- **Strategic Approach**: Improving integration and quality of health information systems through establishment of coordination mechanisms, plans and capacity building

Priority actions

1. Establishment of committee for integration of information planning and management for integrated sectoral health information (Conduct activities for establishment of adaptation of guideline, improvement of analytical skills and provision of IT equipment)
2. Establishment of national standardized information database
3. Development of master plan supporting “one health information system”
4. Development of training scheme for health planners and managers on public health management and IT

System Area 3 Human Resources for Health

Sub Objective & Strategic Approach

- **Sub Objective:** To manage human resource for health in an evidence based and planned manner through improvement of training, reorientation, placement, monitoring and evaluation of health workers.

- **Strategic Approach:** Developing information systems, norms and standards and competency based assessments for management of the health workforce

Priority actions

1. To establish and strengthen national health worker management information system.
2. To develop and update and utilize standards for health worker distribution and deployment according to the changing need for health services of people.
3. To strengthen the physical capacity of pre service and in-service training institutes and Strengthen capacity of teachers in the all of health training institutions.
4. To develop and introduce the mechanism to assess and improve the technical competency of health workers.
5. To establish training system for all health workers and conduct the training in a prospective manner

System Area 4 Logistics , essential medicines systems and traditional medicine

Sub Objective & Strategic Approach

- **Sub Objective:** To ensure that essential medicines and medical equipments and instruments are provided to the health facilities in sufficient quantity (100% of needs) and quality

- **Strategic approach:** Regulation of quality and quantity of essential medicines through development of local production capacity and standards and strengthening of monitoring systems

Priority actions

1. To renovate and upgrade pharmaceutical factories to normalize production according to GMP and to intensify the partnership with UN agencies including WHO and NGOs.
2. To strengthen national monitoring and control activities to ensure the quality, quantity and safety of medicines.

3. Strengthen the Korean Logistics Management and Information System (KLMIS) including drug forecasting, distribution, management and monitoring (capacity building of human resources for production and distribution)
4. To intensify research to improve the quality of traditional medicines and to increase the production of traditional medicines.
5. To establish medical equipment registration system and to upgrade the factories manufacturing medical equipments

System Area 5 Financial management and Health Financing Systems

Sub Objective & Strategic Approach

- **Sub Objective:** To define the financial need for hospital administration and medical services using evidence based approach [Recommended change based on comment from WHO: To identify the financial resource needs of the health sector, and to identify additional sources for financing of gaps].

- **Strategic approach:** Strengthening of health financing research and monitoring systems to support coordination and advocacy for the health sector

Priority actions

1. To review health financing and financial management including the budget processes and cost-effectiveness of service delivery
2. To intensify the collaboration with ministry of financial management and local authorities to secure the financial resources required for the operation and service delivery of health facilities and to establish a monitoring system for the rational use of fund.
3. To formulate time-bound short-, middle- and long-term health financing and management planning (including micro-planning) and strengthen the capacities and skills of the health managers at all levels.
4. To coordinate with domestic and international stakeholders/donors for the effective and cost-effective support to health sector in the development-oriented direction.
5. To empower the health staffs and managers and provide additional incentives to motivate their enthusiasm.
6. To improve cost -effectiveness of service delivery through re-organizing of some of the existing health facilities
7. MoPH to advocate for increase of health sector expenditure by 2015.

System Area 6 Service Delivery Systems (including patient referral system and infrastructure)

Sub Objective & Strategic Approach

- **Sub Objective:** To provide comprehensive quality health care for the whole population.

- **Strategic Approach:** Strengthening health systems in the areas of human resource development, community participation, infrastructure development, quality assurance and essential medicines and supplies and referral systems

Priority actions

1. To update standards for the medical services in health facilities including primary health care facilities.
2. To develop the guidelines to evaluate the performance of section doctors for improved functioning of section doctor system
3. To establish quality assurance system of medical services.
4. To introduce up-to-date medical science and technologies including telemedicine system to improve the quality of medical services.
5. To strengthen the training of health workers.
6. Provision of latest medical equipment and reagent and drug to health facilities
7. Physical renovation of health facilities for quality health care from central to peripheral level.
8. Design and conduct IEC activities to make aware of population for health promotion
9. Strength of transportation for referral
10. Ensure adequate capacity building and equipment supply for implementation of safe blood policy and Lab services

System Area 7 Development of Medical science and Technology

Sub Objective & Strategic Approach

Sub Objective: To conduct research to develop and introduce the up-to-date and high technologies essential for improving the quality of medical services including stem cell, meridian and vaccines for communicable diseases

Strategic Approach: Building medical science and traditional medicine research capacity in DPR Korea

Priority actions

1. To strengthen the trainings, collaboration and exchange of technical experiences to strengthen the material basis and research capacity of medical academic institutions systemically
2. To implement research to develop and introduce up-to-date and high technologies including stem cell therapy, operation of telemedicine system, and development of 3rd generation antibiotics.
3. To intensify the research to develop traditional medical science including researches on meridian
4. Twinning arrangement and networking with international and regional academic and research institutions

System Area 8 Community Participation

Sub Objective & Strategic Approach

- **Sub objective**: Improvements in community awareness and service utilization.

- **Strategic approach**: Using IEC to inform communities on better health and health seeking behaviour

Priority actions

1. To conduct a community/household survey to understand any gaps in health needs versus health demands/service utilization
2. To develop an IEC strategy that reflects national and programme specific health priorities in the context of community needs
3. To pilot the IEC strategy in 4-5 provinces; access impact on household health and health seeking behaviour; and review IEC strategy accordingly
4. Finalization of IEC materials and capacity building of health staff in their use

STRATEGIC AREA 2 NON COMMUNICABLE DISEASE PREVENTION AND CONTROL

STRATEGIC AREA OBJECTIVE

To decrease the burden of non-communicable diseases by reducing the prevalence of common risk factors of major NCDs to 2/3 of present situation and by establishing national NCD surveillance system.

Situation Analysis Non Communicable Disease

The WHO Country Coordination Strategy notes that non communicable diseases account for an increasing burden of morbidity and mortality. This is particularly the case for cerebro- and cardio-vascular diseases, as well as for cancers and respiratory illnesses. The high prevalence of smoking among the adult male population, is also a major contributor to the non-communicable disease burden.[68]

In 2007, the MOPH published an updated "Annual Report of the State of Health." [69] Health status noted in this report included the following:

- Life expectancy at birth for males is 65.2 and females 72.8
- Smoking prevalence of 52.3% of farmers and 58% of workers
- Excessive alcohol rate of 25.9% in survey in 2005 (nationwide)
- Increasing mortality due to cardiovascular disease

A nationwide sample survey of ***smoking*** conducted in 2002 demonstrated that smoking prevalence of male adults was 59.9 percent and the average daily consumption of number of cigarettes was 15.3. The groups with highest smoking prevalence were dependent men and farmers.[70] A repeat survey in 2007 indicated that prevalence had reduced to 52.3%.[71] Excessive alcohol consumption also is described in DPRK. A national survey conducted in 2005 showed the excessive alcohol rate was 25.9%. [72]

Increases in ***hypertension and heart diseases*** are also reported to be major causes of death in DPRK. In the 1960s, the mortality due to hypertension and cerebral haemorrhage accounted for 3.8 percent of total death, but by 1991 this had increased to 24.9 percent in 1991. [73] The morbidity of cardiovascular diseases in 2002 was 172.1 per 10,000 populations. One other source indicates that in DPRK hypertension and cerebral hemorrhage mortality rate was 3.8% of all death cases in 1960s and the figure increased to 24.9% in 1991. For cardiovascular diseases, the percentage increased from 7.1% to 18%, and the trend is reportedly still on the increase.[74] The MOPH annual report for 2007 indicates that ***CVD, cancer and chronic respiratory disease*** account for approximately 60% of all cause mortality. The three major causes of death are: ischemic heart disease (13%), lower respiratory infections (11%) and cerebro-vascular disease (7%). [75]

Table 7 Morbidity Indicators Non Communicable Disease

Morbidity Indicators	Prevalence
Cerebro-vascular disease	17.2 per 10,000 population
Cancer	14.4 per 10,000 population
Chronic respiratory diseases	26.5 per 10,000 population

The rise in rates of non communicable disease has been attributed to (a) ageing populations, (b) changes in dietary habits, (c) high rates of smoking and (d) increasing rates of urbanization since the 1960s. Disability also affects approximately 3.4% of the population. The majority of people affected by disability reside in rural areas (65%), with a higher prevalence of disability in the older age groups. [76]

There is reported to have been increased ***rates of injuries*** caused by an increased frequency of natural disasters and accidents. In 2004, the injury prevalence was estimated 20.9 per 10,000. Various activities have been undertaken for the prevention of injuries. Government has set May and November as the "Month for accident prevention" and promoted education and strengthened control for the prevention of accidents including road and fire accidents, in an effort to minimize longer term public health impacts. [77]

In 2003, a law was enacted for the Protection of persons with ***disability***. [78] There are 54 articles of the Law covering such areas as principles of care, rehabilitation of the person with disability, education, labour and protection. A recent collaboration between an international NGO and a National Association for Disabled persons support for disabled persons may provide a planning model for extending the reach of health programs for various social groups.

Metabolic disorders are also reported to be a public health problem in DPRK. The table below demonstrates prevalence of diabetes in DPRK as measured against prevalence rates in other countries of the Region.

Table 8 Regional and DPRK Prevalence of Diabetes Mellitus [79]

Prevalence (%) of diabetes mellitus in the 20-79 age group	
Timor Leste	1.7
Indonesia	2.3
Myanmar	3.2
Nepal	4.2
DPR Korea	5.2
Bangladesh	5.3
Bhutan	5.4
India	6.7
Thailand	6.9
Maldives	7.1
Sri Lanka	8.4

Interventions for non communicable diseases include (a) strengthened preventive activities and risk factor management by PHC institutions (b) registration and management of chronic patients based on chronic patients preventive observation records, and (c) prevention of occupational diseases. [80]

In terms of ***mental health***, there is a National Prevention Institute for Mental Health. In each province there is one prevention institutes for mental health. To date, there is no survey information available on rates of mental health conditions in the community.

At the Ri level, there are systems of registration for the elderly and disabled persons. At the county level, a medical officer is designated as being responsible for elderly care. At the provincial level, there are specialized sections for care. The household doctor system forms the basis for community support and rehabilitation services at the community level for the elderly and disabled.

Five system areas have been identified by the MOPH for NCD prevention and control and include the following:.

1. Chronic Diseases
2. Injury Prevention
3. Mental Health
4. Disability and Elderly care
5. Tobacco Control

System Area 1 Chronic diseases (CVD, Cancer, metabolic diseases)

- **Sub Objective:** To decrease the morbidity and mortality of NCD by reducing the prevalence of common risk factors of major NCDs

- **Strategic** Approach: Establishing national NCD surveillance system (disease and risk factors) and improving quality of treatment

Priority actions

1. Supporting health promotion programs to decrease the level of prevalence of common risk factors of major NCDs (including establishment of a national public health institute for non communicable disease prevention)
2. Improve the treatment for target NCDs (make assessment, develop guidelines, implement programs in which areas, essential medicines and equipment) of major NCDs to decrease the NCD mortality to1/5 .
3. To establish national NCD surveillance system (improvement of existing NCD information base, NCD research program e.g. diabetes prevalence, hypertension, chronic respiratory diseases, cancer, risk factors)
4. Develop and implement multi-year national strategy for NDC prevention and control
5. Design and implement a capacity building plan for prevention and treatment of NCDs

System Area 2 Injury prevention

Sub Objective & Strategic Approach

- **Sub Objective:** To reduce injury incidence to 2/3 of present figure by establishing national injury surveillance system

- **Strategic Approach:** Develop research and surveillance capacity for monitoring injury and development of guidelines for surveillance and prevention

Priority actions

1. To conduct the survey of injury morbidity in rural and urban areas.
2. To develop national guidelines on injury prevention.
3. To conduct the trainings for specialists and household doctors on the prevention and treatment of injuries by region.
4. To establish the basis for the national surveillance and monitoring system for injury and accidents.
5. To strengthen inter-sector collaboration with concerned sectors for establishing and functioning of national injury surveillance system.
6. Conduct IEC campaigns for injury prevention in targeted areas

System Area 3 Mental Health

Sub Objective & Strategic Approach

- **Sub Objective:** To improve the quality and capacity of health facilities specializing mental health services measured by shortened treatment period to half and decreased recurrent rate below 30% of present figure.

- **Strategic Approach:** Pilot approaches for model mental health care system and ensuring adequately trained mental health care staff and essential medicines

Priority actions

1. To conduct an assessment of current mental health service needs in DPR Korea
2. To update a national mental health strategy
3. To update guidelines for mental health care
4. To pilot mental health case management system in 3 provinces and to create a model facility for mental health care in Central Mental hospital.
5. To organize the training for mental health specialists and neurologists.
6. To ensure the quality of and adequate quantity of essential medicines for mental health care
7. To support community-based mental health care (training. Guidelines and essential medicines for mental health) (pilot testing in 3000 Ris in the plan period)

System Area 4 Disability and elderly care

- **Sub Objective:** To improve the quality of health services for the elderly and disabled

- **Strategic approach:** Improving access to support and care for the elderly and disabled through specialist health care facilities and community-based management and care and support

Priority actions

1. To strengthen elderly specializing sections to provide specialized and quality health services for elderly people.
2. To strengthen health promotion activities of health facilities to raise the public awareness of elderly health care.
3. To develop guidelines and references for elderly health care and to provide the legal basis for quality elderly health care
4. To collaborate with KFDP to identify and respond to health needs of the disabled.
5. Implement community support programs (rehabilitation services) for the disabled through the household doctor system (consolidate with pilot programs for improving community based health care for mental health in 3000 Ris)

System Area 5 Tobacco control

- **Sub Objective:** To reduce the prevalence of smoking by 10% of current figure by 2015

- **Strategic approach:** Implementation of the national tobacco control strategy

Priority actions

1. To strengthen the research to develop materials helpful for stop smoking
2. To conduct the training for health promotion for stop smoking
3. To develop the guidelines and references for stop smoking activities
4. To develop effective IEC materials for stop smoking
5. To establish stop-smoking info base through computer network from central level to provincial level
6. Implement MPOWER (Monitor Tobacco Use and Policy, Protect People, offer help to quit warn about Danger Enforce Ban on Tobacco Advertising raising Tax) strategy

STRATEGIC AREA 3 COMMUNICABLE DISEASE PREVENTION AND CONTROL

STRATEGIC AREA OBJECTIVE

To improve the health status of people by strengthening prevention, early detection and timely treatment of communicable diseases

Situation Analysis Communicable Disease Prevention and Control

Main communicable disease threats in DPRK include ARI and diarrhea in children (discussed in previous sections on child health) and tuberculosis. The interaction between communicable disease and environmental health conditions is discussed in the following section. HIV, although prevalence is low, presents a current and future threat to population health in DPRK. Prevalent vector borne diseases include malaria and Japanese encephalitis.

Tuberculosis [81] [82]

It is currently estimated that there are 120,000 of all forms of TB in DPRK. This estimate was revised upwards following a survey conducted in 2008 which indicated that there were large gaps in reporting from specific sectors that included railways, prisons, defence and police service. This resulted in a revision upwards of prevalence figures from the earlier estimate of 51, 803 to 120,000. As a result of this information, all TB cases diagnosed in the country are now proposed to be registered and notified through the TB registers at the county hospitals.

The National TB control Programme (NTP) introduced DOTS in a phased manner commencing in late 1998 until 2003, when all 208 counties in the country were covered. Case detection rates based on WHO estimates, have been consistently above 90% since 2003, and treatment success rates in excess of 85% continue to be achieved. During 2007, a multi-year strategic plan was developed for the period of 2008-2015, in line with the Global Plan to Stop TB and Regional Plan for TB control 2008-2015. First-line anti-TB drugs have been provided by Global TB Drug Facility (GDF) through grants to the national TB program of DPRK for the last six years, since 2002

The plan proposes TB prevalence and mortality by 2015. Specific interventions proposed by the strategic plan include: (1) Improving the quality of DOTS and extending services to all TB patients, to further improve case detection and treatment success rates; (2) Establishing partnerships with other sectors, departments and organizations; (3) Improving advocacy, communication and social mobilization; (4) developing and implementing interventions for the management of MDR-TB, and (5) contributing to health systems strengthening.

There are now very good prospects for attainment of these objectives. The high treatment completion rates that have been achieved with a very low resource base, and the opportunities presented by community based organizations and NGO partnerships for extension and implementation of the DOTS strategy, the section doctor system, and complementary investments in health system strengthening, will be important factors contributing to the attainment of these objectives. Importantly, the recent awarding of the Global Fund Grant will complement national funding allocations for implementation of planned activities of the multi year strategic TB control plan between 2009 and 2014. Funding needs of $ 46,989,444 have been identified for the program between 2009 and 2014.[83]

HIV-AIDs [84] [85]

HIV transmission is has reported to be low in DPRK. The National Strategic Plan for HIV AIDS Prevention (2008 – 2012) indicates that 28 HIV infected cases were detected among expatriates entering the country. The country's Anti-epidemic stations tested 147,358 persons for HIV from 2005 to 2007 but no positive result was recorded, and no HIV infections were identified in the local populations.

However, little epidemiological information is available in the country. Additionally, there are factors that contribute to some concern regarding HIV prevention. *Firstly*, due to a lack of a strong national HIV surveillance and reporting system, the National Strategic Plan states that it is not possible to assess the actual situation in the country. *Secondly,* the reproductive health survey conducted by CBS indicates that, although the majority of the population has heard of HIV AIDS, the population is not very aware of modes of transmission (particularly as relate to mother to child transmission and through blood transfusion). *Thirdly*, lack of availability of safe blood transfusion services in many locations (and reliance on emergency blood collection in many locations) is exposing the population to additional risks of transmission.

The objectives of the national strategic plan are to (1) To strengthen inter-sectoral collaboration in strategic planning and implementation (2) To improve strategic information systems for evidence-based actions (3) strengthen IEC to promote active participation of the public in disease prevention and control activities (4) strengthen national laboratory network to provide efficient diagnostic support to various clinical conditions with emphasis on early diagnosis of HIV and STIs and (5) Reduce the transmission of HIV and other Transfusion Transmissible Infections (TTIs) through blood and blood products by strengthening the Blood Transfusion Services (BTS) and (6) improve health services in supporting HIV prevention.

HIV testing centres for surveillance activities were established at the Central Anti-epidemic Institute and 10 Anti-Epidemic Stations at Provincial level plus 13 border-county Anti-epidemic Stations. HIV testing was also introduced in central and provincial blood transfusion centres. High priorities in coming years include strengthening systems and facilities to conduct surveillance in order to to strategically guide more effective programming. Additional measures also need to be undertaken to promote blood safety. In 2007, around 80,000 blood units were collected in the whole country against an estimated requirement of 230,000 per year. Based on the CBS findings, awareness raising of the population regarding modes of transmission of HIV infection should also be prioritized.

Malaria [86]

DPRK has been reported to be free from malaria since the 1970s, but the disease re emerged in 1998 (only P. vivax malaria is prevalent in DPRK).[1] The re emergence affected a population of 11,900,000 in the southern and central provinces, which is the economically important areas and comprises about 50 % of the population of the entire country.

[1] Malaria in DPRK is caused P. vivax only. It has a long incubation period of more than 6 months and characterized by frequent relapses. Cases with long-term incubation period account for 80 % of the total cases. Those infected with P. vivax during the transmission season in June to September 2000 produced clinical manifestation from March to August in 2001.

It is thought that changes in environmental conditions in the country (related to irrigation practices, farming practices and flood damage), in addition to limited capacity for public health response, resulted in amplification of the malaria vector. Cases peaked in 2002 at 240,339, and declined to 9353 in 2006, mostly due to public health efforts in the areas of community participation, inter-sectoral collaboration and surveillance and treatment. The MOPH conducted activities for improving early detection and diagnosis of the patients, prompt and early treatment (provision of primaquine chemotherapy), and distribution of insecticide treated mosquito nets to high risk areas, and strengthened health education activities.[87] The Global Fund application notes that DPRK has managed "to dramatically reduce yearly caseloads from that of 296,540 cases in 2001 to just 7,436 cases in 2007, the latter being a 20.5% reduction on year 2006 reports (9,353 cases).[88] The National Strategic Plan for Malaria Prevention and Control indicates that the environmental conditions exist for raid spread to new areas of the country unless adequate control measures are adopted (for elimination of parasites and control of vectors).

Malaria control strategies identified in the National Strategic Plan include:

- Complementary/total supplies of preventative measures such as LLINs and Insecticides for IRS
- Effective and equitable curative measures for malaria infections through the use of CQ/PQ with a strong emphasis on the distribution and access to supplies at the primary health care level.
- Emphasis on BCC through community outreach programmes amongst the target populations covered by prospective sub-recipient partners under GF ATM.
- Strengthening of technical and coordination capacity of the national malaria control programme unit, along with sustained monitoring and evaluation activities at every level as part of system strengthening.

Table 9 Incidence of Communicable Disease in DPRK [89]

Incidence of Communicable Diseases		
Incidence of malaria	2006	9353
Incidence of measles	2006/7	3,000
Incidence of epidemic cerebra-spinal meningitis	2008	13
Incidence of pertussis	2008	498
Incidence of rubella	2008	123
Incidence of small pox	2008	152
Incidence of parotitis	2008	187
Incidence of dysentery	2008	4541
Incidence of hemorrhagic fever	2008	45
Prevalence of TB(100000 population)	2008	418
Multi-drug reflection rate of TB	2008	4%
Prevalence of Hepatitis B antigen	2003	4.5%

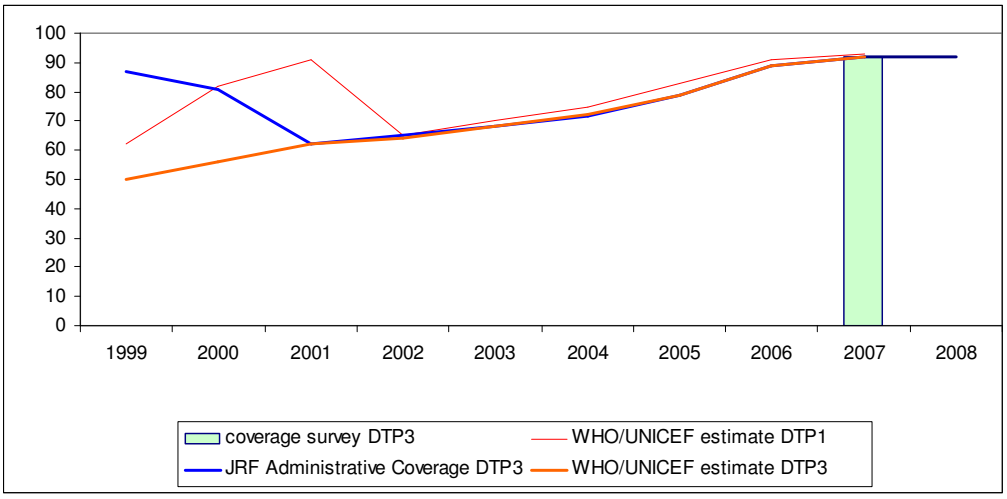
The Global Fund Rd 8 proposal has 4 specific objectives which include (1) enhancing case management through maximising the use of confirmatory diagnosis and delivery of

effective antimalarial therapies (2) scaling up of an integrated approach to prevent and control malaria (3) Integrating community involvement as a successful way to raise awareness on the prevention and management of malaria and (4) enhancing components of the national malaria control programme and health system through capacity building and monitoring and evaluation. Table 6 outlines the incidence prevalence of major communicable diseases. No human cases of avian influenza have been reported, although cases have been identified in poultry. The first H1N1 cases were reported in DPR Korea in the last quarter of 2009. National consultations highlighted the need for high levels of surveillance, outbreak response and emergency preparedness in order to respond effectively to emerging disease threats.

Vaccine Preventable Disease

The national medium term EPI Plan (2007 – 2011) [90] documents the impressive gains in immunization that have been made since the 1990s. No wild ***polio*** cases have been identified since 1996, and polio eradication was certified by WHO SEARO in 2007. Hepatitis B vaccine was introduced into the program in 2001, and tetravalent vaccine was introduced into all counties in 2007. Immunization trends have indicated a steady improvement in EPI coverage since 2003 (68%) to a rate of 92% in 2008 (DPT3). Coverage has been validated by a facility based survey conducted in 2008 (national coverage survey using 30 cluster methods in 10 provinces).[91] DPR Korea is one of three regional countries that have developed and implemented national plans targeting ***measles elimination***, with the national program recently introducing a second dose of measles into the routine program through GAVI support. This followed an outbreak of measles in 2007 which resulted in the reporting of 3550 cases. [92] ***Neonatal tetanus*** in DPRK is reported to have been eliminated by WHO.[93]

Figure 9 Immunization Coverage 1999 – 2008 [94]



However, the national EPI Plan indicates that immunization gains have been uneven across the country, with remote areas in particular not achieving the same results. Inequities in coverage are attributed to weaknesses in the timeliness of transportation of vaccines, monitoring and supervisory activities and IEC activities. Also, despite high reported and survey coverage, the 2008 WHO/UNICEF Joint Report confirms ongoing

incidence of vaccine preventable disease. 82 cases of measles, 124 cases of ***Japanese encephalitis*** and 395 cases of ***pertussis*** were reported in 2008.[95]

The national program has been strengthened in recent years through the development of a financial sustainability plan for immunization in 2003,[96] followed by the development of a costed multi year plan for immunization (2007 – 2011). The most recent annual progress report for GAVI indicates that in coming years, immunization service strengthening grants will be utilized to strengthen cold chain systems.[97] In terms of new vaccines, GAVI support has been utilized to introduce the second dose of measles in July, 2008, and international support was also achieved for conducting of a Japanese encephalitis campaign in 2009.

The MOPH has developed a national Strategic Work Plan for the prevention and control of hepatitis B disease. Strategies are include improving timeliness of the birth dose, reducing the risk of vaccine freezing, catch up campaigns and vaccination for high risk populations, increasing diagnostic capacity and strengthening of IEC activities. DPR Korea is committed to achieving the WHO-recommended goal of reducing the chronic HepB virus infection rate to <2% among children <5 years of age by 2012.[98] A nationally representative sero-survey will be required to demonstrate definitively when the goal has been reached.

Challenges for the 2010 – 2015 planning period include maintenance of high immunization coverage, introduction of ***new vaccines*** (Haemopylus Influenza B) and potentially rotavirus and pneummoccocal vaccines, as well as introduction of the live JE vaccine into the routine program. New vaccine introduction, although providing an excellent opportunity for attainment of millennium development goals for child mortality reduction, also presents formidable challenges in terms of both surveillance and financial capacity of the national program.

Six system areas have been identified by the MOPH and development partners in the strategic area of the communicable disease prevention and control. They are:.

1. Immunization
2. TB control
3. Malaria Prevention and Control
4. HIV Prevention
5. Viral Hepatitis Prevention and Treatment
6. Pandemic Planning

Strategic Plan Communicable Disease Control

System Area 1 Immunization

- **Sub Objective**: To reduce the morbidity of vaccine preventable diseases to 2/3 of present figure by 2015 and to ensure the coverage of major vaccines > 97%.

- **Strategic Approach**: Developing local vaccine production and strengthening management capacity and maintenance of high immunization coverage

Priority actions

1. To strengthen the capacity of vaccine factories including NRA and NCL to produce vaccines of high quality and sufficient quantity.
2. To improve the organization of immunization services to cover the whole population including new-born and pregnant women, [through support for surveillance, cold chain and logistics, vaccines, surveillance, IEC and other operational costs] [introduction of new vaccines like Hib, Rotavirus and pneumoccocal vaccines]
3. To intensify scientific research to develop new vaccines and diagnostics for influenza, HBV, HCV and HIV/AIDS.
4. To establish and operate an EPI database through extension of computer network from central to county level.

System Area Malaria

- **Sub Objective**: To achieve the elimination of malaria by 2015

- **Strategic Approach**: Strengthening health system capacity for prevention and treatment of malaria and increasing population awareness of prevention

Priority actions

1. To strengthen comprehensive interventions to prevent malaria including IVM (Integrated Vector Management).
2. To intensify IEC activities to motivate the community to malaria prevention [costed in health systems strategic area]
3. To strengthen the capacity of malaria programme
4. To improve M&E of health system
5. To implement the operational research program for elimination of malaria

System Area 3 Tuberculosis Control

- **Sub Objective**: To reduce the TB mortality and prevalence to half of present figure and to increase TB detection rate to more than 70% and cure rate to more than 85% by 2015.

- **Strategic Approach**: Strengthening health system capacity for improved detection and treatment

Priority actions

1. To provide standard DOTS service with high quality in overall country (ISTC).
2. To improve the quality of diagnosis for all form of TB by providing modern diagnostic equipments.
3. To provide adequate treatment and management for MDR TB patients.
4. To carry out the ARTI survey in 2013
5. To strengthen promotion activities to prevent TB.
6. To strengthen M&E activities of health system.

System Area 4 HIV Prevention and Control

- **Sub Objective:** To maintain HIV/AIDS free status in the country

- **Strategic approach:** Developing health system capacity and population understanding for prevention of HIV

Priority actions

1. To establish HIV/AIDS health information system [costed in health systems strategic area]
2. To strengthen HIV/AIDS surveillance system and to strengthen the surveillance activities.
3. To strengthen the capacity to conduct IEC activities for HIV/AIDS prevention [costed in health systems]
4. To strengthen the capacity of health facilities to provide health counseling, examination and management of HIV/AIDS
5. To develop HIV diagnostics and to improve the lab capacity to diagnose HIV
6. To implement activities for the prevention of transmission according to epidemiology of HIV/AIDS

System Area 5 Viral Hepatitis Prevention And Treatment

- **Sub Objective:** To strengthen the capacity of national Hepatitis Control Program in order to reduce the incidence and prevalence of Hepatitis B & C in DPRK for implement the national strategy to stop the epidemics of viral hepatitis in DPRK by 2015.

- **Strategic approach:** Expand immunization coverage and develop health system capacity to diagnose and treat

Priority actions

1. To train epidemiologists and lab technicians specializing in hepatitis.
2. To develop IEC materials and strengthen IEC activities for the prevention and control of Hepatitis B [costed in health systems]
3. To establish hepatitis information management system.
4. To strengthen the capacity of health facilities to provide diagnosis and treatment of hepatitis.

5. Expand Hepatitis B vaccination coverage (although this is an EPI activity, it should still be here so the prevention and control strategy is consistent. The activity would however be costed in the EPI component)

System Area 6 Pandemic Planning

- **Sub Objective**: To strengthen the capacity to respond to pandemic or emerging epidemic diseases

- **Strategic approach**: Strengthening information systems and screening methods and raising population and multi sector awareness

Priority actions

1. To strengthen multi-sectoral collaboration in order to rapid and timely respond to the pandemics and to establish early warning system.
2. To strengthen core capacity for the implementation of IHR (2005) including diseases inspection and quarantine activities at the country entry points
3. To strengthen disease surveillance including detection and screening activities at primary health care level to timely detect the contacted people and carriers.
4. To strengthen lab capacity of anti-epidemic institutions.
5. To establish nationwide communicable disease information system as a part of health management information system of MoPH and to intensify collaboration and cooperation with external parties.

STRATEGIC AREA 4 WOMENS AND CHILDRENS HEALTH

STRATEGIC AREA OBJECTIVE WOMEN AND CHILDRENS HEALTH

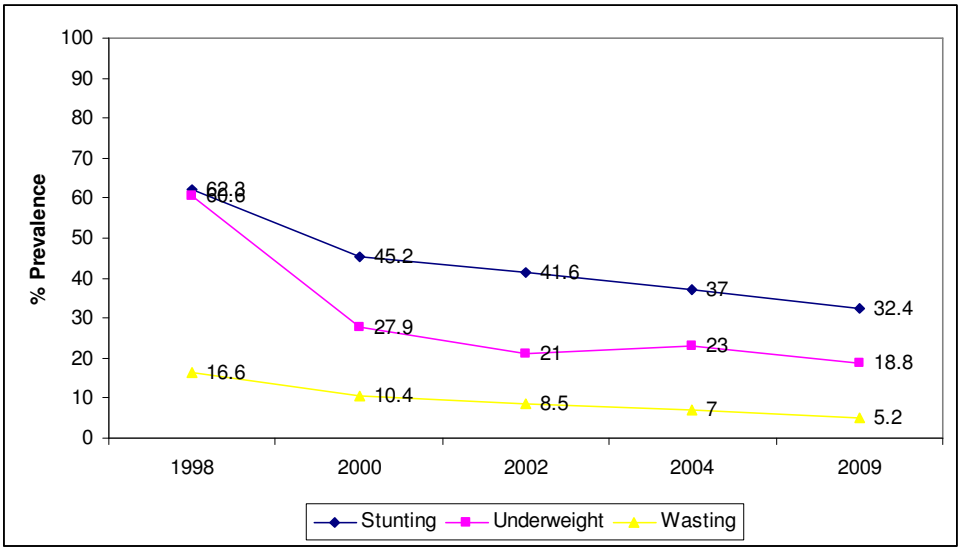
To protect and improve the health of women, children and adolescents to decrease mortality to ¾ of present figure by 2015

Situation Analysis Women's and Children's Health

Nutrition

As described in the introduction, DPRK has been confronted by significant problems of ***food insecurity*** since the mid 1990s. Particular problems have been noted at the sub national level in the north-eastern mountains and the flood and drought prone parts of the country with a large population Ryanggang, North Hamgyong and South Hamgyong provinces. [99] The fundamental problems relate to the fact that one fifth of the DPRK's land is suitable for high-yield agricultural production without intensive use of inputs.[100] The principle source of cereal foods is through the Public Distribution System (PDS). The UNICEF Situation of Women's and Children Report indicates that the population is adapting to food insecurity through obtaining multiple sources of food which include (1) purchases from private markets, (2) transfers from relatives, (3) the cultivation of kitchen gardens and (4) the collection of wild foods. In the 2004 nutrition survey, most households reported multiple sources for all types of food with the PDS as the most common source of staple foods and with about 20 per cent of households identifying the market as the source of staple food. [101]

Figure 10 Prevalence of Malnutrition 1998, 2000, 2002, 2004 and 2009 [102]



The figure above demonstrates gains in ***nutritional status*** between the crisis years of the mid 1990s and 2009. Nevertheless, high stunting rates (32.4%) are still a concern. This means that just under one third of children (aged 6 and under) based on these most recent figures are chronically malnourished, leading to concerns regarding psychosocial and physical development of these children over the longer term. The situation is also improving for pregnant women. In 2004, 32 % of the women with a child less than 24 months were malnourished as indicated by a mid upper arm circumference (MUAC) less than 22.5 cms. This figure has decreased to 27.7% in the MICS survey of 2009.[103] However, it should still be noted that maternal malnutrition is associated with an increased prevalence of stunting in children.[104]

As was observed with the issue of inequities in immunization coverage, the 2004 NNA noted wide variations in rates of stunting across provinces. Two provinces (South Hamgyong and Ryanggang), had a very high level of stunting based on WHO criteria of more than 40 per cent, and four other provinces had high levels of 30-39 per cent, thereby demonstrating the high levels of vulnerability of the population in the north east of the country to public health risk form food insecurity.[105]

The recent MICS survey observes higher coverage of micro-nutrient interventions. 98% of children under the age of 6 months had received ***Vitamin A*** in the last 6 months. A similar result for vitamin A coverage (97.5%) was achieved for women aged 15 – 45 who had given birth within the previous two years.

A study of ***goitre prevalence***, caused by iodine deficiency, conducted some years ago in eight provinces, found rates ranging from 4 to 26 per cent depending on the province.[106] A previous MICs study found that only 1.7 per cent of households surveyed had fully iodized salt.[107] However, the more recent 2009 MICS survey found that the percent of households consuming adequately iodized salt was 24.5% (15 ppm or more), 43.7% for less than 15ppm and 32% had 0 ppm.[108]

Reproductive Health

As has been reported for other health programs, there has been some improvement reported in recent years in relation to reproductive and maternal health. However, the WHO Country Cooperation Strategy estimates ***maternal mortality*** to be between 90 and 390 per 100,000. UNICEF states that the MMR in 2002 was still 87/100,000, which was higher than the figure for 1993 (54/100,000). [109] The census report of 2008 indicates that the MMR is 85 per 100,000 live births, which is slightly lower than routine reporting data. Moreover, more than half of the maternal deaths occur at home.[110] A recent independent evaluation of the MOPH Women's and Children's Health Project indicated that maternal deaths were frequently reported in non-project sites and in project sites that had just commenced activities, with the most common causes being post partum hemorrhage or other obstetric emergency related deaths at county hospitals.[111]

Due to very high human resource / population ratios, and the geographic accessibility of facilities, the vast majority of deliveries take place in facilities (86.9% in urban areas and 83.9% in rural areas) and in the care of skilled health staff (99%).[112] Similarly, in the 2006 survey findings for the CBS national Reproductive Health Survey, high access was demonstrated by the fact that nearly all pregnant women, (99.4%), visited a health care facility at least once during their pregnancy. One of every ten babies is delivered at home. The proportion in the rural areas is significantly higher (14.6%). These findings are confirmed by the 2009 MICS survey, which equally demonstrate rates of ANC and delivery care by trained staff in facilities.

The ***abortion ratio*** is high in DPRK. For every 1000 live births, there are 121 induced abortions.[113] This suggests unmet need for family planning services. According to survey findings, nearly 1 of every 10 such women or 9.6% has an unmet need for ***family planning*** and this unmet need in the rural areas is more than double that in the urban areas (15.8% as against 7.5%).[114] The survey furthermore indicates that the preferred

method of contraception is IUD, with little suggestion of widespread availability of other methods such as pill and condoms.

In terms of health knowledge, the CBS survey results indicate that despite the relatively high level of awareness of HIV/AID's, knowledge of how the disease gets transmitted remains low. Despite the previous alluded to high rates of anemia in pregnant women and prevalence of low birth weight (6.3%), only 37.9% of pregnant women took iron supplements during pregnancy in the required amounts (although the survey reports that the proportion had doubled in 2006 when compared with the previous survey). The study furthermore observed that very few follow the recommendation of UNICEF and WHO to breastfeed a baby soon after birth (i.e. within 30 to 60 minutes after birth). Only in 6.2% of the cases are babies' breastfed within 2 hours of birth.

Persisting high mortality rates provide evidence of limitations of ***quality of maternal care***. Factors limiting maternal health care access to essential obstetric care include (1) lack of essential equipments and skills at the ri level where 28% of births take place, (2) lack of diagnostic skills in early detection of risk, (3) logistical challenges to referral in the harsh winter months and (4) limited skill and surgical capacity at referral points in the county hospitals.[115] However, a recent multilateral program of MOPH and WHO for improving women's and children's health has demonstrated the capacity of the health system to respond to these challenges. Quantitative data collected by WHO/MOPH indicates changes in the quality of services at the hospital level as demonstrated by decrease of referrals to higher level for obstetric emergencies, increases in the number of deliveries, a greater level of safety and trust from patients receiving surgery and increases in the number of blood donors. [116]

A national reproductive health strategy has been developed by the MOPH and development partners and addresses the three reproductive health priority areas of safe motherhood, family planning, and maternal nutrition during the planning period of 2006 – 2010.[117] The Women's and Children's Health project 2008 – 2010 [118] identifies an essential package of maternal health care interventions that includes:

- Quality prenatal, natal and post natal care and services
- Management of obstetric complications through provision of emergency obstetrics services
- Expansion of safe abortion services
- Provision of control, prevention and management of RTI/STI
- Provision of breast and cervical cancer screening services

Child Health

UNICEF notes an ***under 5 mortality rate*** of 55/1000.[119] WHO 2008 statistics report estimates an infant mortality rate of 42/1000.[120] The census report released in December 2009 identified that infant (19.3/1,000) and U5 child mortality (26.7/1,000)[121] Though lower than previously reported figures, these results are still higher compared with the levels in 1990. The main causes of death in children under five reported by UNICEF are diarrhoeal diseases and acute respiratory infections (ARIs), combined with malnutrition as in many other developing countries. Little is known about causes of death in the peri-natal and neonatal periods.[122]

As just under one third of pregnant women are malnourished, maternal anemia and protein-energy malnutrition are key contributing factors to child malnutrition as evidenced by the increased prevalence of stunted (22 per cent) and underweight (43 per cent) children amongst malnourished mothers. Both the 2002 and 2004 nutrition assessments showed the association between maternal malnutrition and increased prevalence in stunting. [123] As stated earlier however, the recent MICS study in 2009 has demonstrated improvements in rates of maternal malnutrition between 2004 and 2009.

The percentage of mothers who ***exclusively breastfeed*** their infants (aged 0-5 months) was found to be 90.5% in the 2009 MICS survey, although the percentage of mothers whose infants received breast milk and semi solid foods was 27.5% for infants aged 5 – 9 months.

There have been some noticeable achievements in child health programming in DPRK in recent years. 98% per cent of children under five years old have received twice-yearly ***vitamin A supplementation***, reaching the highest level of coverage of vitamin A for children under age five in the East Asia and Pacific region.[124] [125]A 1998 survey found ***immunization coverage*** for three doses of combined diphtheria/pertussis/tetanus vaccine (DPT3) at 37 per cent and for measles at 34 per cent.[126] A coverage survey conducted in 2008 by the MOPH and UNICEF has confirmed that DPT3 coverage has now increased to 92%.

A recent independent evaluation of the MOPH and WHO program for improving women's and children's health has noted the increase in quality and coverage of child sickness care as a result of the introduction of training and supervision programs for ***integrated management of childhood illness*** (IMCI).[127] The IMCI strategy commenced implementation in 2 counties, after which it was expanded to 29 counties. It is proposed to cover 75 more counties by 2010 and reaching 100% coverage by 2011. Integration of the IMCI in the pediatrics training curriculum has been piloted in the capital's medical university with a proposal to cover all medical schools between 2008 and 2010. IMCI is all proposed to be integrated into pre-service curriculum of nursing and midwifery programs in a phased manner.[128]

The Women's and Children's Health project (2008 – 2010) identified the need to implement a ***Child Survival Strategy***. The strategy focuses on the implementation of an "Essential Package for Child Survival" that comprises the following:[129]

- Skilled attendance during pregnancy, delivery and the immediate postpartum;
- Essential newborn care
- Breastfeeding and complementary feeding;
- Micronutrient supplementation;
- Immunization of children and mothers;
- Integrated management of sick newborn and children;
- Use of insecticide-treated bednets (in malaria-endemic areas).

System Area 1 Maternal Health

- **Sub Objective:** To decrease the maternal mortality from 85 per 100,000 births to 60 by 2015

- **Strategic Approach:** Improving access to maternal health services through health system strengthening approaches

Priority actions

1. To establish referral system for complicated pregnancies
2. To strengthen the capacity of EMOC and ENC at hospital level to scale up 50 % by 2015
3. Introduce evidence based cost effective interventions into primary care for pregnancy, delivery and post natal care (review and update of existing practices and establish clinical standards, protocols and norms for pregnancy, improving quality of ANC at primary level delivery and postpartum care)
4. Improve quality maternal health services - Infrastructure, blood safety, laboratory services, equipment supply [costed in strategic area 1] (service delivery).
5. Uninterrupted supply of essential medicines for mothers and children

System Area 2 Neo Natal

- **Sub Objective:** To decrease neonatal mortality rate to ¾ by establishing intensive resuscitation and management system at hospital level

- **Strategic Approach:** Commence strengthening of neonatal services in DPR Korea through development and implementation of standards of neonatal care

Priority actions

1. To set up the neonatal center in Pyongyang Maternity Hospital and intensify the training of neonatalists.
2. To conduct the training of provincial trainers on essential neonatal disease care and newborn referral care in 4 provinces and extend country level trainings.
3. To provide necessary materials (essential medicines and consumables) to neonatal in provincial hospitals.
4. To develop and print the references (guidelines on neonatal & pediatric care)

System Area 3 Reproductive Health

- **Sub Objective**: To reduce preventable mortality and morbidity from reproductive health risk behaviors and conditions

  Strategic Approach: Improving availability of and accessibility to quality reproductive health services, counseling and information

Priority actions

1. Improving access to family planning services through provision of a range of modern contraceptive methods and ensure uninterrupted constant supply of essential supplies and information
2. Improvement of safe abortion practices and post abortion care including counseling on family planning (scale up of existing guidelines through capacity building and uninterrupted supply of essential medicines and supplies and information).
3. Develop of standards for surveillance and proper diagnosis and treatment of RTIs
4. Intensify IEC activities for community on reproductive health issues [costed in health systems]
5. To establish the breast and cervical cancer early detection system through massive screening at 5 provincial
6. To strengthen the capacity of 5 provincial hospitals to provide surgical treatment of cervical and breast cancer.
7. To strengthen the capacity of 5 provincial level hospitals to make histological diagnosis

System Area 4 Child Health

- **Sub Objective**: To decrease the child mortality from 26.7 to 16.0 per 1,000 by 2015 and to decrease infant mortality from 19.3 to 14.8 per 1,000 by 2015

- **Strategic Approach**: Extension of IMCI Strategy nation wide including developing capacity for hospital based care

Priority actions

1. To intensify the training on IMCI and increase the IMCI introduced across the country.
2. Implement standards and norms of pediatric hospital care (guidelines implemented country wide – training programs) (Child Health System)
3. Establish information system for child health management
4. Build the capacity for uninterrupted supply of essential drug and equipment and consumables
5. Implement community education and involvement

System Area 5 Nutrition

- **Sub Objective:** To decrease rates of malnutrition and micronutrient disorders

- **Strategic Approach:** Focusing on monitoring of child and maternal survival and implement programs to address micronutrient deficiencies

Priority actions

1. To implement child survival and growth monitoring
2. To implement programs on micro nutrients control among mothers and children

   i. Iron supplementation
   ii. Vitamin A supplementation
   iii. Iodized salt
3. Undertake a research program on nutritional status and micro nutrients control
4. Strengthening institutional capacity for nutrition program implementation
5. To implement programs for MMN control among mother and children

System Area 6 Adolescent Health

- **Sub Objective**: Improve over all health and awareness of adolescents regarding unhealthy behaviors and reproductive health (including maternal health)

- **Strategic approach**: Improvements to adolescent health care through health promotion and health services more targeted to the needs of adolescents

Priority actions

1. Improve inter-sectoral collaborations with education sector for dissemination of health information for adolescents
2. To intensify the IEC / community activities on adolescent health care to raise the public awareness [costed in health systems].
3. To strengthen health promotion for adolescent health care at schools to raise the awareness and knowledge about reproductive health and hygiene among adolescents
4. To strengthen the capacity of health facilities to deliver quality adolescent health services. (including medical consultation and examination for adolescents)

STRATEGIC AREA 5 SOCIAL AND ENVIRONMENTAL DETERMINANTS OF HEALTH

STRATEGIC AREA OBJECTIVE SOCIAL & ENVIRONMENTAL DETERMINANTS OF HEALTH

To provide healthy and hygienic environment for living and working including safe foods and water for promoting the health status of population

Situation Analysis the Environmental Determinants of Health

The publication in 2008 `of the report of the Global Commission on the Social Determinants of Health has highlighted the fact that it is the daily conditions in which people live and work that is most important contributing factor to human health, along with improved accessibility to quality health services. Accordingly, this health sector plan provides a balance between strengthening of health systems and a focus on the social and environmental determinants of health.

A range of environmental pressures have impacted on public health in DPRK in the last 20 years. Recent times have witnessed the prevalence of extreme weather events, particularly flood and drought, which have impacted negatively in particular on food production and the nutritional status of the population. The sharp decline in national incomes associated with natural and economic catastrophes of the 1990s, and the subsequent decline in food availability, was likely to have been a contributing factor to the resurgence of communicable diseases including TB and malaria. Change in irrigation and farming practices associated with the economic downturn, and these recent extreme weather events have also created environmental conditions favorable to the spread of vivax malaria vectors resulting also in a sharp rise in cases in the same period.

Overall energy production per capita in DPRK in 2004 was estimated to be 30 per cent of 1989 levels, with per capita energy consumption in rural areas amounting to half of the national average, indicating limited access to energy services. This has contributed to declines in agricultural production, the underutilization of electric-powered irrigation systems, and disruption of transport.[130] As a result of this energy scarcity, “households have resorted to cutting trees for fuel wood and cultivation of slopes.” This further increases the threat of soil erosion and increases flood risk. This overview demonstrates clearly the links between environment, economy and human health in DPRK.

A national State of the Environment Report prepared in 2003 with the support of UNDP and UNEP identified five key environmental issues that currently act as barriers to attain sustainable development. These include forest depletion, water quality degradation, air pollution, land degradation and biodiversity. The report further provides guidance on the outlines of an environmental action plan.[131]

Issues with food security, the resurgence of malaria, and recent extreme weather event all point to concerns regarding the impacts of ***climate change*** on human health in DPRK. The 4th Assessment of the Intergovernmental Panel on Climate Change (IPCC Asia) indicated that crop yields in many countries of Asia have declined in recent years mainly due to rising temperatures and extreme weather events. The IPCC states that the frequency of climate-induced diseases in Asia has increased with rising temperatures and rainfall variability. About 2.5 to 10% decrease in crop yield is projected for parts of Asia in 2020s and 5 to 30% decrease in 2050s compared with 1990 levels. Aside from threats to food security associated with decline in crop yields, the direct health effects of climate change include increases in endemic morbidity and mortality due to diarrhoeal disease and increased incidence of vector borne disease associated with the expansion of the natural habitats of vector-borne and water-borne diseases, particularly in north Asia. [132] All of these Asian trends in climate change, coupled with epidemiological and

environmental trends in DPRK, all point to the need for effective climate change adaptation planning particularly in relation to human health.

In the majority of the areas in DPRK, ***water supply*** is provided through pumping systems with the water sourced from streams and rivers. Ground water supply systems are tapped in the form of open wells and bore wells.[133] However, since the economic difficulties and natural disasters of the 1990s, many of these systems have been poorly maintained, leading to high rates of water borne diseases. This can impact on the quality of health care facilities. A recent water and sanitation assessment of health facilities has noted that in many Ri and County hospitals visited, water is available only on an irregular basis (6 hours a day in some locations). This has impact in particular on infection control in the hospital setting due to limited opportunity to practice regular hand washing.[134]

In DPRK, 96% of the population is reported to have access to an improved water source; 82% to an improved drinking water source and 99.2% to an adequate excreta disposal facility. [135] However, the UN strategic framework notes that access to piped water had declined significantly from 83 per cent to 53 per cent between 1994 and 1998. The reliance on shallow wells resulted in a decline in water quality, particularly in the rural areas, where there is risk of potential contamination from fertilizers and animal and human waste. The UN framework document also indicates that the river systems have become "significantly polluted" owing to the consequences of population pressure and untreated industrial waste. [136] A more recent MICS study conducted in 2009 once again demonstrates high access safe water (89% using tap water systems), although less information is available on the quality of water supply. 4% of the population report treating the water, and 18% report boiling of the water.

Potential ***water borne disease*** related to poor water supply include trachoma, cholera, typhoid, and schistosomiasis. Drinking water can also be potentially affected by chemical, physical and radiological contaminants. Although overall there are high rates of piped water systems to households, there are concerns regarding the quality of the water supply. A MICS study conducted in 2000 established that, although households have access to various sources of water, access to this water is time-limited due to irregular power supply. Malfunctioning of pumps and contamination of water due to erosion of water pipes were also identified as important issues. In many rural areas, chemical disinfection of water is not done regularly. Pipe leaking rates were estimated at 30 percent in many regions. [137] The MICS study confirmed that in the 1990s, the series of natural disasters had severe impacts on both water supply and sewerage systems. Clear distinctions in quality of ***sanitation systems*** between urban and rural areas were noted in the study. Irregular water supply systems have resulted also in inability to maintain flush toilet sanitation systems, with most households now reliant on open air pit latrines.[138] The 2009 MICS study reports that 95% of the population either use flush or pit latrine systems, although no information is available the quality or maintenance of these systems.

A WASH sector situation analysis conducted as part of the UN strategic framework highlighted the following main challenges in responding to the significant needs in water and sanitation:

1. Diarrhoea is the number 1 cause of morbidity and mortality for under 5 children in DPR Korea. As much as 19% of under 5 deaths are due to diarrheal diseases linked to poor quality of water, sanitation and unsafe hygiene practices.

2. Water systems are falling into disrepair and are ageing, calling into question long term sustainability.
3. Water quality monitoring and surveillance systems are not well developed in DPR Korea and a systematic approach is required to strengthen the capacity of the relevant institutions.
4. Current existing shallow pit latrines in rural areas and small towns are unsafe and unhygienic
5. Outside Pyongyang, there are inadequate and sewage and waste water disposal systems
6. DPR Korea has a high number of qualified technicians and engineers, however they are less familiar with the latest technologies and materials.
7. In terms of gender, women and older girls are the main collectors of water for use at home

In terms of overall response to the environmental determinants of health, the WHO Country Cooperation Strategy recommends a focus on emergency preparedness, water quality, hospital waste management, climate change and food safety in the coming years.

Six system areas have been identified by the MOPH and development partners in the strategic area of the social and environmental determinants of health. These are as follows:

1. Food Safety
2. Health and Hygiene promotion
3. Climate Change
4. Safe Water and Sanitation
5. Healthy Living Conditions
6. Emergency Preparedness

It should be noted that this plan is focusing on the role of the Ministry of Public Health in environmental health. For this reason, particularly in terms of water and sanitation, activities largely focus on monitoring of water quality, health education and water and sanitation infrastructure development *at public health facilities*. The Ministry of Public Health does not have responsibility for maintenance of water and sanitation systems more broadly, although advocacy for such system development is an important role.

STRATEGIC PLAN SOCIAL AND ENVIRONMENTAL DETERMINANTS OF HEALTH

System Area 1 Food Safety

Sub Objective & Strategic Approach

- **Sub Objective:** Strengthening the capacity of the MOPH in planning, research and surveillance in targeted parts of the country to minimize the incidence of food borne diseases.

- **Strategic Approach:** To minimize the incidence of food-born diseases by establishing HACCP (Hazard assessment and criteria control points) system and strengthening laboratory capacity

Priority actions

1. To develop and implement 5 year strategic plan and action plan
2. To strengthen the capacity of laboratory surveillance (To provide necessary equipments, instruments, standards and reagents for chemical, microbiological and toxicity tests of central lab and to renovate and modernize the laboratories in the east and north border areas)
3. Capacity building of human resources for food safety surveillance
4. Updating the guidelines and norms and standards for food safety
5. Establishment of food borne diseases and risk factors surveillance system
6. To strengthen the research for food safety

System Area 2 Health and Hygiene Promotion

Sub Objective & Strategic Approach

- **Sub Objective:** More than 30% of schools, enterprises, cities and villages reach the standard for good hygiene by 2015.

- **Strategic Approach:** Research and development of norms and standards and organizational structures for health promotion

Priority actions

1. To focus on the research to upgrade hygiene standards for promoting health status of people
2. To set up the correct norms and standards for the model units of good hygiene and to motivate the community to create healthy environment by encouraging them to reach the standards of good hygiene

3. To designate the officials and volunteers in ri offices who are responsible for creating healthy environment.
4. Organize the training of the staff who are involved in implementation (health education training)

System Area 3 Climate Change

Sub objective & Strategic Approach

- **Sub Objective**: DPRK to have full knowledge and understanding of the extent and effect (especially health) of climate change on the people of DPRK by the end of 2012

- **Strategic Approach**: Developing surveillance systems and adaptation plans to inform and assist the DPRK to manage the health effects of climate change, within the context of a wider national climate change adaptation response

Priority actions

1. To conduct a vulnerability assessment to consider the impacts of climate change on human health in DPR Korea
2. To develop a national Climate Change Adaptation Plan to manage the health effects of climate change including water and food borne disease, emergency preparedness for extreme weather events, vector borne disease, and food security
3. Strengthening disease surveillance to monitor impacts of climate change on health
4. To provide necessary equipments, reagents, capacity building, guidelines for climate monitoring to central and provincial AES in east, west and central areas of the country
5. To strengthen IEC activities to protect people from harmful atmospheric factors
6. Set up strengthen align necessary institutional arrangements in coordination with WHO and other international agencies on surveillance and response planning
7. Implement environmental legislation to reduce harmful health effects of climate change by 2011
8. Conduct awareness training and advocacy on health impact of climate change in all provinces

System Area 4 Safe Water and Sanitation

Sub Objective & Strategic Approach

- **Sub Objective**: To provide sanitary facilities and to ensure the safety of drinking water in both rural and urban areas

- **Strategic approach**: To strengthen collaborations with relevant national and international agencies to improve the adequacy and safety of water and sanitation

Priority actions

1. To intensify the collaboration with Ministry of Chemical Industry and Ministry of City Management to ensure the quality and quantity of drinking water (piloting of water safety plan approach in 2 counties by 2012)and scale up to 30 counties by 2015
2. Development and implementation of a research program to conduct a systematic assessment of water and sanitation needs at targeted public institutions in 2 counties
3. Design a system of norms and standards for water and sanitation systems at public institutions
4. To provide adequate water and sanitation facilities to 30% of all health facilities by 2015 (approx 63 counties and 570 Ri)
5. Research and development of a IEC program for healthy behaviors to support the quality improvement of water and sanitation systems
6. Strengthen capacity for AES for quality water monitoring (3 fellowships) and equipments and reagents (mobile test kits)

System Area 5 Healthier Living Conditions

Sub Objective & Strategic Approach

- **Sub Objective**: To provide healthier and safer living environment by strengthening the surveillance of environmental factors from different industries

- **Strategic approach**: Building laboratory surveillance capacity for assessment environmental risk and developing norms and standards for monitoring

Priority actions

1. To conduct a needs assessment of lab capacity at central and provincial level to build capacity for assessment of different environmental risk factors from different industries
2. To intensify the training of specialists
3. To strengthen the environmental risk factor surveillance system
4. To develop the guideline on environmental risk factor surveillance
5. To intensify IEC activities to promote healthy living environment and living style
6. Strengthen hospital waste management systems (assessment, guideline development, capacity building)

System Area 6 Emergency preparedness

Sub Objective & Strategic Approach

- **Sub Objective**: To decrease the health effects of disasters by developing the emergency response health system

- **Strategic Approach**: Strengthening the health system capacity for emergency response through development of a health sector national response plan

Priority actions

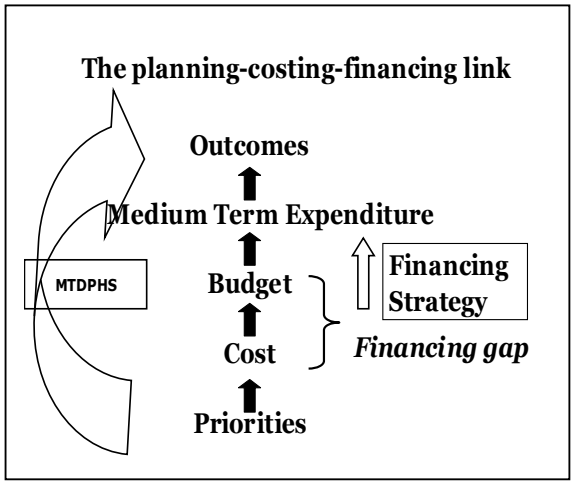
1. Assess the capacity of health institutions for emergency response by the end of 2010
2. Conduct vulnerability assessment of epidemics and man made disasters by the end of 2010
3. Design guidelines for community mobilization for emergency public health measures by 2014
4. Strengthen national institutional capacity to manage emergency situations by the end of 2011 (preparedness, response and mitigation)
5. Develop and early alert and warning system by 2011
6. Develop community education and capability building to deliver first aid
7. Strengthen mitigation action and emergency and hospital care by 2013
8. Design the logistics systems and ensure sustainability of essential medicines and supplies fro emergency preparedness by 2013

COSTING AND FINANCING THE PLAN

Placing costing and financing options in the context of the Medium Term Development Plan for the Health Sector

The Plan document thus far has detailed the link between national health priorities with desired health outcomes. This is captured in the six Strategic Areas and the associated Systems Areas with specified Objectives and Activities. Critical to successful implementation of the Plan is its financing: *what is the cost of delivering identified priorities; how does this resource requirement compare with available funds; and, what are the feasible financing options to fill any resource gap?* Further, as the figure below indicates, this implies the **need to consider financing options and develop a financing strategy**, including a medium term expenditure plan, to support the Plan.

Figure 11 Planning-Costing-Financing Links



The cost of delivering Plan priorities may be assessed in two ways: by assessing unit costs or by using cost comparisons. Unit costs include all costs - direct and indirect - relating to the provision of a particular service. This requires detailed, disaggregated information which can be both time consuming and costly to collect. The cost comparison method estimates resources from different organizations for delivering comparable products or services. This top-down approach to costing is quicker and less costly but is valid only when services being compared will have the same consequence. International experience suggests both methods yield similar costs.

Cost comparisons have been used to cost of the Plan. For some services e.g. immunization, bottom-up unit costs are available from recent intervention specific plans developed for DPR Korea (EPI); for other activities, like IT training, 'standard' international costs have been used.

The full cost of the Plan for implementation of priority interventions is just over USD 442 million (including HR costs). Government investment is included at current levels – the planned increase from 5.9% to 7% of GDP is not yet secured and, also, this increase may be absorbed by adverse movements in exchange rates, domestic inflation and/or size of

GDP, implying no change in public spending in real terms. The highest cost component is human resources - DPR Korea has shown consistent commitment to HR investment and population coverage by health workers.[2] International contributions included are funds committed for all or part of the Plan period.

The funding gap for priority interventions is estimated at about USD 303 million i.e. 67 per cent. It is also useful to examine this gap as a proportion of costs *net* of human resource spending. This captures the capital and operational costs needed by staff to deliver services. Table 10 and Figure 12 show this at an (expected) higher proportion of 50 per cent (with the absolute amount almost unchanged at USD164 million).

The Tables also present cost estimates by Strategic Areas and Systems Areas. Including HR makes Strategic Area 1 – Health Systems Strengthening the largest component of the Plan with a relatively small funding gap. However, if human resources are excluded, this makes Strategic Area 3 (Communicable Diseases) as the largest component. In both scenarios, very little financing can be yet be identified for Strategic Areas 2 and 5 – Non-Communicable Diseases and Social and Environmental Determinants of Health.

Note: In an integrated approach to health systems strengthening, *all* human resource spending in included under Strategic Area 1.

Note further: Two high-cost activities have been omitted until detailed needs assessments are carried out: upgrading and scaling-up of vaccine and pharmaceutical factories. Using international standards to establish a vaccine factory alone would increase the cost of the plan by about $200m. [3]

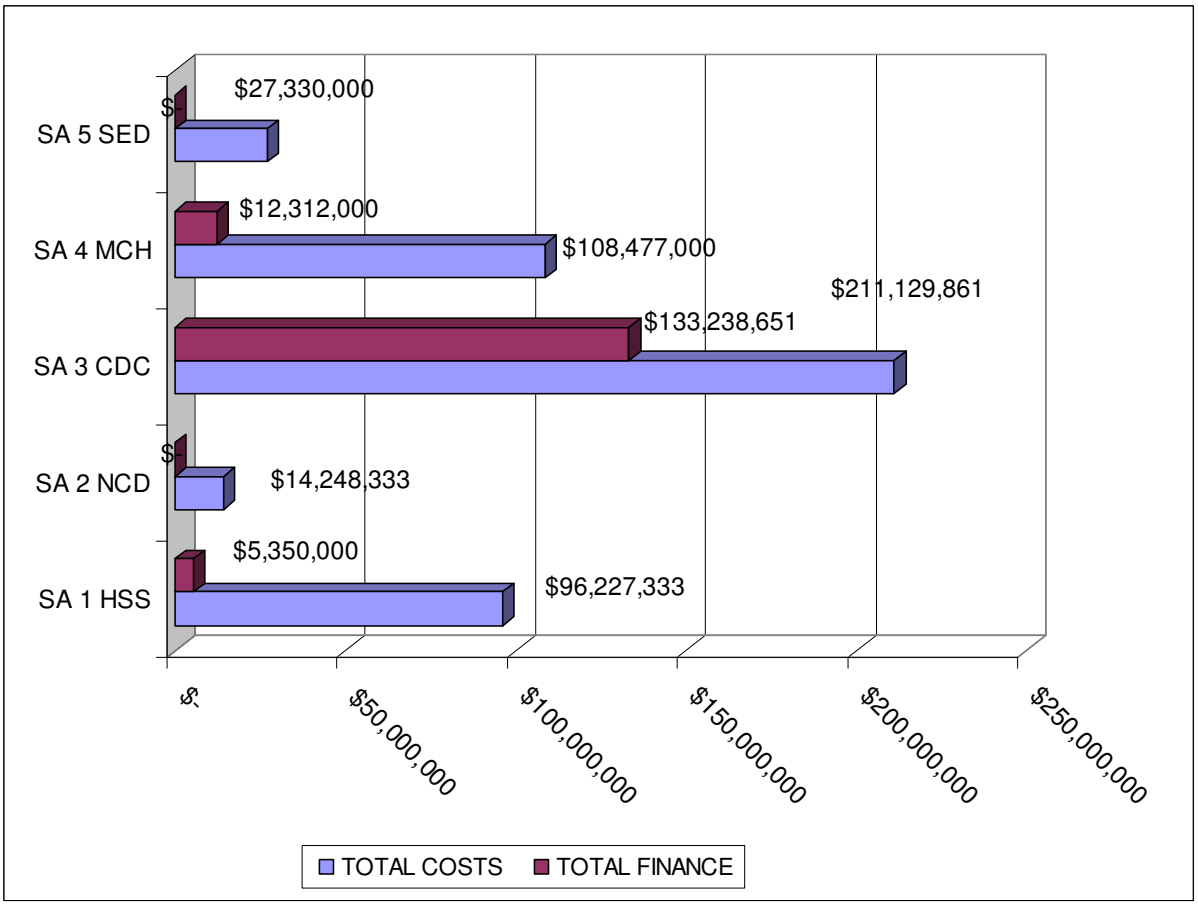
Table 10 Full costing and associated financing and resource gap

	TOTAL COSTS	TOTAL FINANCE	FINANCE GAP	% GAP
SA 1 HSS	$ 96,227,333	$ 5,350,000	$ 90,877,333	94
SA 2 NCD	$ 14,248,333	-	$14,248,333	100
SA 3 CDC	$ 211,129,861	$133,238,651	$77,891,210	37
SA 4 MCH	$ 108,477,000	$12,312,000	$ 96,165,000	89
SA 5 SED	$ 27,330,000	-	$ 27,330,000	100
TOTAL	$ 457,412,527	$ 150,900,651	$306,511,876	67%

[2] Estimates based on Multi Year Plan for EPI (2006), MoPH.

[3] Estimates for the cost of bringing to GMP standadrds the production of 1 vaccine is included in the plan

Figure 12 Costing and associated financing and resource gap



How does this resource requirement compare with available funds?

The Table and resource gap estimated from the difference between costed plan activities and committed funds flags three key issues:

1. The fully costed Plan implies a multi-fold increase in annual health investment
2. The resource gap (excluding HR costs) is about 66 % and urgently requires a financing strategy
3. The scaling-up of health activities in the Plan has important implications for absorptive capacity of the existing health systems and this in turn requires detailed **annual implementation plans** to phase-in activities as requisite capacities are strengthened

What are the feasible financing options to fill the resource gap?

The particular characteristics of the DPR Korea economy severely limit budgetary flexibility[4] and possible options for creating fiscal space for financing the Plan could be a combination of:

[4] Creating budgetary flexibility or 'fiscal space' for additional investment in health may be done in the follow ways:

1. ***Increasing government revenues for health.*** The Plan does already include an increased share of government revenues for health – from 5.9% to 7% of GDP. As noted above, in real terms, this may imply little or no increase in resources available for health – the increase may be absorbed by adverse movements in exchange rates, domestic inflation and/or size of GDP implying no change in public spending in real terms. An alternative way is to make a strong case for increasing the share of health– this is difficult given competing government priorities but, one option may be to argue for earmarking a proportion of sales proceeds from tobacco and alcohol based on their direct impact on health. In is important to note here that countries that have imposed such 'sin taxes', additional revenues amount to only a small fraction of the health budget (2% in Thailand).

2. ***Reprioritisation and rationalization of government expenditure.*** Some resources can be freed up through improvements in technical and allocative efficiencies from three particular areas: cost-effectiveness in selection of interventions; rationalization in the areas of service delivery and human resources; and, the rational use of medicines. These areas need to be assessed for potential efficiency gains and 'additional' resources; and, annual implementation plans be drawn up to effectively phasing in and create synergies between activities e.g. HR training.

3. ***Increase in external grants.*** This is the most viable option to bridge the large resource financial gap in the Plan. However, Overseas Development Assistance (ODA) for DPR Korea is constrained in terms of both volume as well as flow of funds once resources have been secured. To overcome this, innovative ways to manage ODA need to be explored that could attract increased donor contributions while at the same time also satisfy DPRK government's conditionalities as a recipient.

Examining what has worked in the current environment, ODA in-flows seem to have been successfully channeled via international funds – e.g. GFATM and GAVI – through arrangements with UN agencies in the country (WHO and UNICEF). The fund mechanism option was also used effectively under similar conditions in Myanmar during the recent natural disaster.[5]

Key characteristics of this mechanism that overcome donor constraints are:

1. a comprehensive national plan developed collaborative with key stakeholders
2. adherence to donor conditions with respect to health and development/humanitarian objectives
3. a platform that could secure better accountability and transparency of funds

---

$$\Delta FS = \{\Delta R + \Delta E + \Delta B_d + \Delta B_e + \Delta G + \Delta M\}$$

where

ΔFS is a change in fiscal space
ΔR is an increase in government revenues
ΔE is a reprioritisation and rationalization of government expenditure
ΔB_d is an increase in domestic borrowing
ΔB_e is an increase in external borrowing
ΔG is an increase in external grants
ΔM is an increase in money supply through printing of currency

[5] Based on the Post-Nargis Recovery and Preparedness Plan.

4. aid effectiveness created by pooling of donors funds

From the recipient's perspective, the fund mechanism could:

1. attract new donors, including those not forthcoming with bi-lateral aid, thereby increasing resources available for health
2. improve aid-effectiveness by consolidating all contributions
3. allow countries better flexibility in use of funds within the health sector

These strengths are reinforced by (usually) a tri-partite arrangement between donor representatives; agreed 'neutral' third parties in country; and, the recipient national agency.

The process for application for funds may be adjusted to suit the specific context in which the mechanism is being used.

The on-going comprehensive and collaborative health planning exercise could be an important opportunity to discuss the possibility of establishing a **DPR Korea Health Sector Development Fund** with donors. The challenge will be overcome donor reluctance to invest in DRPK and create momentum around existing contributions – a viable way to do this is to approach donors already contributing to health development in DPR Korea, requesting them to pool their current bi-lateral transfers. Three steps could assist in developing a proposal to establish this mechanism:

1. Prioritize activities in the Plan
2. Match national priorities with donor priorities
3. Approach 'matching' donors with a prioritized implementation plan and proposal for a DPR Korea Health Sector Development Fund, including a governance structure; structure for flow of funds; and, M&E based on 'best practices' - compatible with the DPRK context

Based on in-flows, government financing may need to be shifted to cover persisting gaps.

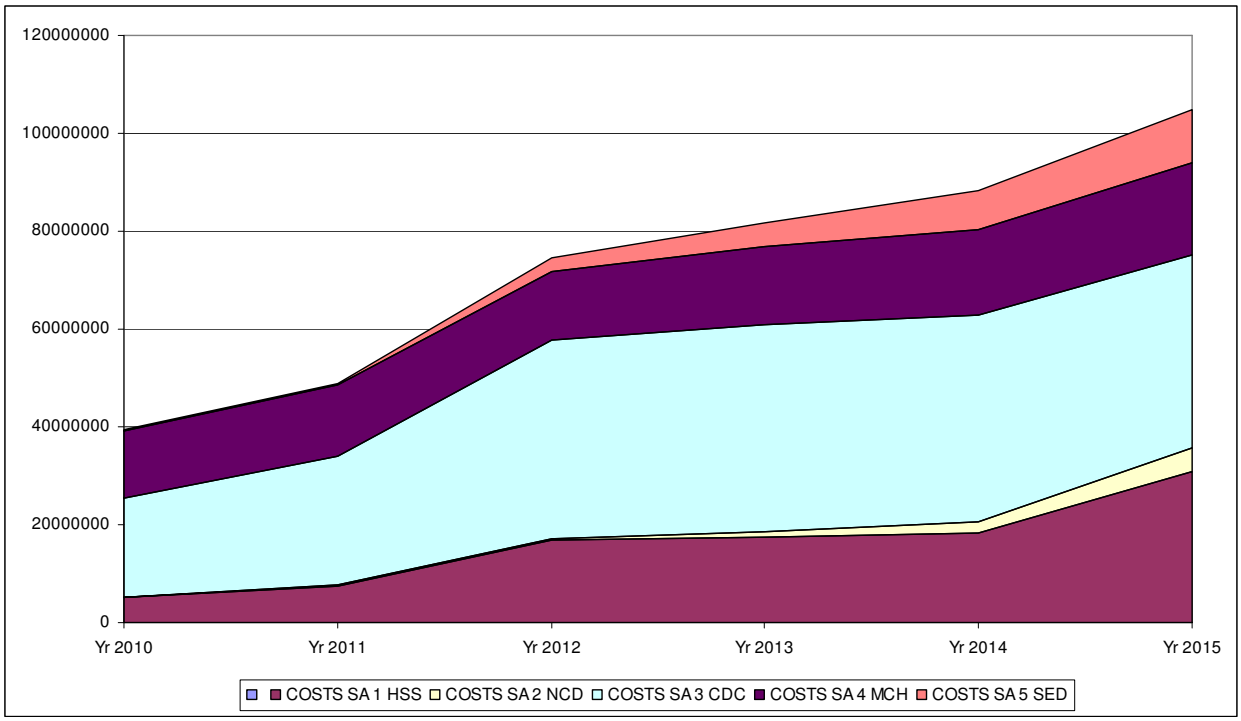
Figure 8 presents a possible financial implementation scenario (based on actual costing for priority interventions in this plan) with the following progressive phasing-in of the Plan:

Year 1: continuation of on-going activities; some increase in capacity building e.g. training; studies/needs assessment for additional activities proposed in the Plan; and, resource mobilization
Year 2: continuation of on-going activities; some further increase in capacity building; finalization of studies/needs assessment for additional activities proposed in the Plan; and, resource mobilization
Year 3: continuation of on-going activities; and, with initiation of in-flow of additional funds, implementation of new activities based on needs assessments and requisite capacity building in previous/current year(s)
Year 4: continuation of on-going activities; and, stepping-up of Plan implementation
Year 5: full Plan and financial implementation

Assumption: the financing gap can be fully funded

Figure 13 describes the cost projections based on the gradual scale up of activities that are outlined in Annex 1 (Implementation priorities 2010 – 2012) and the detailed costing from the expenditure framework (Annex 2).

Figure 13 Scale up of Plan 2010 - 2015

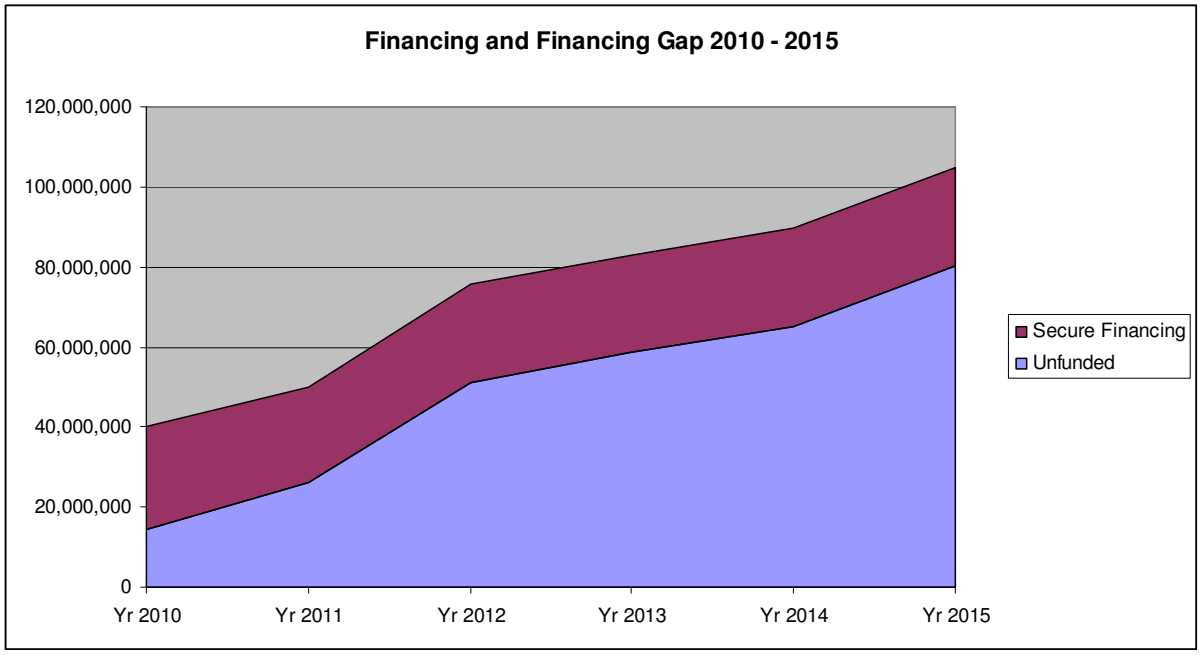


Financing of priority interventions also reflects the pattern of scale up, and also the predominance of financing options for years 1 -2. This is labeled as “secure financing” and applies to most UN funded programs. Longer term secure financing is available for communicable disease control, given that Global Health Initiatives have the capacity to commit funding up to 2015 (subject to successful proposals submissions by countries).

What is important to note is the critical financing gaps for health systems development and maternal and child health in the short term (years 2010 – 2012), which strengthens the cases for proposing alternative financing mechanisms (such as the DPR Korea Health Development Fund) in order to meet the urgently essential drug, equipment and infrastructure needs of the system.

The curve of secure financing is gradual throughout the plan period, as financing from GHIs is projected to increase over this period, and funding from UN agencies is labeled as “secure” up to 2012.

Figure 14 Financing of priority Interventions



MONITORING AND EVALUATION STRATEGY

Introduction

Five strategies have been identified for monitoring and evaluation of the medium term health sector plan. They are as follows:

1. Establishing a national monitoring and evaluation framework
2. Implementing a health systems and public health research agenda
3. Improving the quality of the health information system
4. Establishing processes and structures for oversight of planning implementation and monitoring and evaluation
5. Strengthening management and planning systems

1. Establishing a National Monitoring & Evaluation Framework

Consensus should be reached on a national monitoring and evaluation framework that address the main strategic areas of the plan, as well as the following:

1. Main *inputs* to the plan specifically in relation to health financing, human resources and essential medicines and consumables (for example doctors per 10,000 population or government health funding per capita)

2. Main *health system out puts* of the plan including measures of improved service access and services quality (for example % facilities providing EMONC to agreed standards or % facilities with a functioning cold chain for vaccines)

3. Main *health outcomes* of the plan including coverage of interventions and risk factors and behaviours (for example ante natal care or immunization coverage)

4. Main *health impacts* including life expectancy, mortality and disease prevalence and incidence (for example, infant and maternal mortality rates)

Based on a plan document and literature review, including findings from the latest MICS and CENSUS surveys conducted in 2009, a list of baseline indicators was developed. The census and multi cluster surveys, and baseline survey for women's and children's health, were conducted as partnership studies between government agencies (MOPH, CBS and NIPHA) and international agencies and institutes (UNICEF, UNFPA and Nossal Institute).

Utilizing the WHO guidelines on M & E frameworks, a workshop was conducted with program managers in March 2010 which identified a list of priority indicators (with a focus on outcomes) for measurement of plan implementation and impact. This priority list was then integrated into a wider M & E framework that is included in the annexes to this plan.

Sources of data include health information systems and surveys. The framework describes the indicator name and definition, source of data, year of baseline and target for 2015.

The table below provides a sample of main indicators. The complete monitoring and evaluation framework is included at the end of this section.

Table 11 List of Selected Indicators from the Monitoring and Evaluation framework

INDICATOR	Baseline	Source	Target 2015
% Govt. Expenditure on health as a % of GDP	5.9%	MOPH	7%
Midwives per 1000 population	0.3	MOPH	0.4
Coverage of EMOC Services	2	MOPH	10
Counties implementing IMCI	72	MOPH	162
No of registered and treated TB cases	79,000	UNSF	100,000
% Ri clinic with low levels of consumables	82%	NIPHA	30%
% facilities with access to safe blood	75%	MOPH	100%
Measles coverage	98%	MOPH	98%
TB smear case detection rate	69%	MOPH	> 80%
Tobacco use in adults	52.3%	MOPH	45%
Coverage of Household by either LLIN or IRS	25%	MOPH	> 80%
Maternal Mortality ratio	85	CENSUS	77
Incidence of Malaria	1.6/1000	MOPH	.8/1000

2. Implementing a Health Systems & Public Health Research Agenda

The medium term health sector plan details proposals for public and health systems research in such areas as water and sanitation, nutrition, climate change and health systems. Baseline results have been informed by cluster and baseline surveys for women's and children's health, immunization and child health, and includes updated demographic and outcomes data from recently completed census and multi cluster surveys. In order to measure progress from the baseline, repeat surveys have been integrated into the medium term health plan in order to measure progress against 2015 targets. Figure * below outlines some of the research studies proposed for implementation in the period of the medium term plan.

3. Improving the Quality of the Health Information System

The system area of "health information" details some strategies for improving the quality of health information data that includes improved coordination of information between programs and sectors, improving the quality of information data bases, developing capacity for using health information for planning purposes and improving integration in the national health information system.

4. Establishing a Structure and Process for Joint Monitoring of Implementation of the Medium Term Plan

A process will be required by which progress can be assessed and resourced mobilized for implementation.

For this reason, it is proposed that a National Health Sector Forum be established in DPR Korea for the primary purpose of overseeing the joint monitoring and resource mobilization for plan implementation. The proposed broad terms of reference for the Health Sector Forum (to be chaired by the MOPH) are proposed as follows:

1. Monitoring progress against the M & E framework
2. Mobilizing resources to identify funding gaps
3. Recommending corrective action and adjustments to the plans based on outcomes of research findings, M & E or supervision
4. Coordination of international resources for health
5. Health policy dialogue between the MOPH and development partners on matters relating to national and international health
6. Annual and mid term reviews of plan implementation

Figure 15 Public Health and Health Systems Research Agenda DPR Korea

Research Programs Identified in the Medium Term Plan

1. Research to improve the quality of traditional medicines and to increase the production of traditional medicines
2. To review health financing and financial management including the budget processes and cost-effectiveness of service delivery

Strengthening the capacity of the MOPH in planning, research and surveillanc

Non Communicable Disease

(1) Chronic Diseases
(2) Injury
(3) Mental health
(4) Aged care & Disability
(5) Tobacco Control

3. nge on human health in DPR Korea
4. Strengthening disease surveillance to monitor impacts of climate change
5. Conduct a systematic assessment of water and sanitation needs at targeted public institutions in 2 counties
6. Conduct vulnerability assessment of epidemics and man made disasters by the end of 2010
7. To conduct a needs assessment of lab capacity at central and provincial level to build capacity for assessment of different environmental risk factors from different industries
8. Research and development of a IEC program for healthy behaviors to support the quality improvement of water and sanitation systems
9. Conducting research programs on nutritional status and micro nutrients control
10. Conducting operational research for the elimination of malaria
11. To establish national NCD surveillance system (improvement of existing NCD information base, NCD research program e.g. diabetes prevalence, hypertension

5. Strengthening Management and Planning Systems

Health sector planning should link to sub national health needs and annual operational planning systems. DPR Korea has a centralized planning system, but proposals are in place (through GAVI HSS) to strengthen management and planning capacity at Provincial and County levels.

An annual review of the health sector plan should take place with provincial participation, as well as quarterly meetings with the health sector forum.

DPR Korea has a centralized planning model, but the need was established in previous proposal developments (GAVI HSS and Global Fund) to improve management and planning at Provincial and County level. Design work will need to be undertaken in order to strengthen annual implementation plans at Provincial and County Level in order to describe the health development needs of specific areas. Other options for consideration for development of management and planning systems includes the following:

- Development of Annual Implementation Plans at central level
- Development of Provincial Implementation Plans (and guidelines)
- Development of County Implementation Plans (and guidelines)

Table 12 Strengthening of Systems for Planning Implementation

Milestones in Development of Planning Systems	2010	2011	2012	2013	2014	2015
Annual Health Sector Review						
Quarterly Health Sector Forum						
Capacity Building Provincial & County Planning						

The development of an annual implementation planning system will in particular enable coordination of implementation, particularly in areas such as infrastructure development, communication strategy and human resource development. This strengthened coordination will enable a gradual scale up of the plan between 2010 and 2015.

Table 13 Complete Monitoring and Evaluation Framework

The monitoring and evaluation indicators are organized according the following categories:

Main *inputs* to the plan specifically in relation to health financing, human resources and essential medicines and consumables

Main *health system out puts* of the plan including measures of improved service access and services quality

Main *health outcomes* of the plan including coverage of interventions and risk factors and behaviors

Main *health impacts* including life expectancy, mortality and disease prevalence and incidence

INPUTS		Indicator definition	Source	Baseline	Year	Target 2015
Health financing	% Govt. Expenditure on health as a % of GDP	% Govt expenditure on health as a % of Total GDP	WHO NHA	5.9%	2008	7%
Health workforce	Doctors per 1000 population	Doctors per 1000 population	HR plan	3.2	2007	3.3
	Nurses per 1000 population	Nurses per 1000 population	HR plan	3.8	2007	4.8
	Midwives per 1000 population	Midwives per 1000 population	HR plan	0.3	2007	0.4
	% Staff trained in IT	% staff at province and County trained in IT	MOPH	40%	2009	90%
	% health workers trained with WHO standard guidelines of SoPs on emergency preparedness and response	% staff trained	MOPH	30%	2009	100%
	% planner and health manager trained through routine system	% staff trained	MOPH	40%	2009	90%
	Coverage of HH Doctor	No of households per household doctor	MOPH	130 HH	2009	120 HH

	OUTPUTS	Indicator definition	Source	Baseline	Year	Target 2015
Service Access	% Ri clinic provide 24/7 basic emergency obstetric and neonatal care (BEMONC) and county hospitals CMENOC	% Ri clinic that provide BEMONC and CMENOC to agreed standard	UNSF	30%	2009	90%
	% county hospital with functional referral system between Ri and County level	% county hospital with transport and communication systems for referral	MOPH	0%	2009	100%
	No of provinces with ENC service	No of provinces with ENC service according to agreed standard	MOPH	2 province	2009	10 province
	No of provinces with EMOC Services	No of provinces with EMOC service according to agreed standard	MOPH	2 province	2009	10 province
	No of province with Neo natal Intensive care Unit	No of province with Neo natal Intensive care Unit	MOPH	2 Province	2009	10 Province
	No of counties implementing IMCI	No of counties that have been trained in IMCI	UNSF	72	2009	162
	Number of registered and treated tuberculosis cases	No of cases identified and successfully treated	UNSF	79,000	2009	100,000
	Coverage of blood screening against HIV in health settings	% counties that have testing facility for HIV for blood screening	MOPH	50%	2009	75%
	% HH doctor trained in recently developed national section doctor's training package	% HH Doctor that has received standard training program in the last 5 years	UNSF	0	2009	90%
Service Quality and Safety	TB treatment success rate (DOTS)	% clients who successfully completed treatment for TB	Global TB report	86%	2008	>86%
	County Hospitals and Clinics with regular water supply and adequate sanitation	% county and Ri clinics that have water and sanitation according to agreed standard	Survey	N/A	2009	30%
	% county facility with low levels of laboratory services	% county that have low level of laboratory service according to criteria established in the baseline survey	NIPHA survey	90%	2009	30%
	Coverage of access to quality mental health care	No of facilities that have mental health care services according to agreed standards	MOPH	N/A	N/A	80%
	Coverage of access to quality aged health care and disability services	No of facilities that have aged and disability care services according to agreed standards	MOPH	N/A	N/A	80%
Supplies	% Ri clinics with Low Levels of consumables (medicines and supplies)	% county that have low level of consumables according to criteria established in the baseline survey	NIPHA survey	82%	2008	30%

	% County Facilities with low levels of blood services capacity	% county that have low level of blood services capacity according to criteria established in the baseline survey	NIPHA survey	90%	2008	0%
	% Province and County with Effective use of component blood	% Province and County with Effective use of component blood	MOPH	12%	2009	30%
	% Facilities with access to safe blood services	% facilities (county and province) that have blood services according to agreed standards	MOPH	75%	2009	100%
	No of facilities providing standard health services	% facilities providing services according to agreed service package	MOPH	50%	2009	80%
	No of counties implementing water safety plans (WHO Standard)	No of facilities implementing safe water plans according to WHO international standards	WHO	0	2009	30

OUTCOMES		Indicator definition	Source	Baseline	Year	Target 2015
Coverage	Antenatal care coverage (including blood test)	% ANC coverage (1 or more visits) including routine blood tests	MOPH	80%	2009	95%
	Skilled birth attendance	% births attended by doctor or midwife	MICS	100%	2009	100%
	DPT 3 - Hepatitis B Immunization coverage	% child under the age of 1 vaccinated with DPT- Hep B	MOPH Survey	92%	2009	96%
	Measles coverage	% child under the age of 1 vaccinated with measles	MOPH Survey	98%	2009	98%
	Contraceptive prevalence rate	% women aged 18 - 45 using modern method	WHO	68%	2009	68%
	TB smear+ case detection rate	% expected TB cases testing positive by smear	Global TB rep	69%	2008	> 80%
	Coverage of MDR-TB treatment	% TB cases MDR TB successfully treated	MOPH	0%	2009	10%
	Coverage of De-worming among children	% children under the age of 5 who received de-worming treatment in the last 12 months	MOPH	80%	2009	>90%
	Coverage of Household by either LLIN or IRS	% household in high risk area covered by either LLIN or IRS	MOPH	25%	2009	>80%
	Coverage of laboratory confirmed cases		MOPH	50%	2009	>80%
	Iodized salt consumption	(% households consuming iodized salt < 15 ppm)	MICS	44%	2009	
	Coverage of cancer screening (Coverage of Screening in 25-49 of age	% women aged 25 - 45 screened for cervical cancer in the last * years	MOPH	0	2009	>50%
	Coverage of treatment service	% detected cancer cases treated	MOPH	ND	2009	>50%
Risk factors	Tobacco use (adults smoking rate)	% male adults smoking	MOPH	52.8%	2008	45%
	Access to improved water sources (tap and non tap)		MICS		2009	
	- ARD <5 ,		MOPH	13%	2009	10%
	- AD <5		MOPH	14%	2009	11%
	Percentage of families required to fetch water to meet domestic needs		Survey	15%	2009	20%
	% health facilities have running water and soap available for practicing hand-washing.		UNSF	N/A		>50%
	Access to improved sanitation		MICS			
	Low birth weight newborns	% newborns with weight < 2.5 Kg	MICS	6%	2009	4%
	Breastfeeding exclusive for 0 - 5 months	% mothers exclusively breastfeeding their infants until 5 months of age	MICS	91%	2009	97%

	Early Initiation of breastfeeding		MOPH			
	Rates of Stunting in Children		MICS	32%	2009	
	Mid Upper Arm Circumference of Mother	% of mothers whose MUAC is less than 22.5	MICS	27.70%	2009	
	Rate of male alcohol consumption	% male adults consuming alcohol	MOPH	25.9%	2005	2/3 of present figure
	Hypertension in males		MOPH	20.4	2009	2/3 of present figure
	Hypertension in females		MOPH	17.1	2009	2/3 of present figure

IMPACT			Source	Baseline	Year	Target 2015
Mortality	Child Mortality Rate	No of child deaths under the age of 5 per 1000 live births	CENSUS	26.7/1000	2009	
	Infant mortality	No of infant deaths under the age of 1 per 1000 live births	CENSUS	19/1000	2009	14/1000
	Maternal mortality ratio	No of maternal deaths per 100,000 pregnancies	CENSUS	85/100,000	2009	54/100,000
Morbidity	TB Prevalence		WHO	441	2009	
	Incidence of malaria cases	No of new cases of confirmed malaria case per 1000 population	UNSF	0.3/1000	2009	0/1000
	HIV prevalence among adults 15 - 49	No of current HIV positive cases	MOPH	0	2009	0
	Prevalence Diabetes Mellitus		MOPH	7/100000	2009	1/5 of present figure
	Prevalence CVD		MOPH	172.1/100000	2009	1/5 of present figure
	Prevalence Cancer		MOPH	14.4/100000	2009	1/5 of present figure
	Prevalence CRD		MOPH	26.5/100000	2009	1/5 of present figure
	Prevalence of Injury		MOPH	20.9/10000	2009	15/10000
	Incidence of Acute Respiratory infection (ARI) in under five children		ARTI survey/UNSF	13%	2009	10%
	Diarrhea Incidence	% children aged - -59 months with diarrhoea in the last 2 weeks	MICS Survey	14%	2009	10%

Annex 1 Implementation plan and priorities 2010 – 2012

IMPLEMENTATION PLAN	2010	2011	2012	AREA	FUNDING STATUS	SOURCE
Strategic Area 1 Health Systems						
Mobilize additional international resources for health through development of a multi year health sector plan				National Level	Secure	GAVI HSS
Undertake financial analysis to identify priority resource gaps in the health sector				National Level	Secure	GAVI HSS
Development of master plan supporting "one health information system"				National Level	Secure	GAVI HSS
Development of training scheme for health planners and managers on public health management and IT (national level and 6 provincial level)				National Level and 6 Provinces	Secure	GAVI HSS
To establish and strengthen national health worker management information system.					Not secured	
To strengthen the physical capacity of pre service and in-service training institutes and Strengthen capacity of teachers in the all of health training institutions.				Nationally and in 4 provinces	Not secured	
To develop and introduce the mechanism to assess and improve the technical competency of health workers. (1 national 4 provinces)				Nationally and in 4 provinces	Not secured	
To renovate and upgrade pharmaceutical factories to normalize production according to GMP and to intensify the partnership with UN agencies including WHO and NGOs.				2 factories at national level	Not secure	
Strengthen the Korean Logistics Management and Information System (KLMIS) including drug forecasting, distribution, management and monitoring (capacity building of human resources for production and distribution)				Nationally and all provincial levels	Secure	UNFPA
To establish medical equipment registration system and to upgrade the factories manufacturing medical equipments (1 national level)				National Level	Not secure	
To review health financing and financial management including the budget processes and cost-effectiveness of service delivery				National level	Secure	MOPH
To intensify the collaboration with ministry of financial management and local authorities to secure the financial resources required for the operation and service delivery of health facilities and to establish a monitoring system for the rational use of fund.				National Level	Secure	MOPH
MoPH to advocate for increase of health sector expenditure by 2015.				National Level	Secure	MOPH
To update standards for the medical services in health facilities including PHC facilities.				National level	Not secure	
Provision of latest medical equipment and reagent and drug to health facilities(				National Level & 6 provinces	Probable for 2 years	UNICEF, WHO, IFRC
Physical renovation of health facilities for quality health care from central to peripheral level.				6 provinces in first 2 years	Probable for 1 Year	WHO

IMPLEMENTATION PRIORITIES	2010	2011	2012	AREA	FUNDING STATUS	SOURCE
Ensure adequate capacity building and equipment supply for implementation of safe blood policy and Lab services (3 provinces)				3 provinces in first 2 years	Secure for 1 Year	WHO
To strengthen the trainings, collaboration and exchange of technical experiences to strengthen the material basis and research capacity of medical academic institutions systemically					Not secure	
To implement research to develop and introduce up-to-date and high technologies including stem cell therapy, operation of telemedicine system, and development of 3rd generation antibiotics. (3 health institutes and hospitals)				National and 3 health institutes and hospital	Not secure	
To conduct a community/household survey to understand any gaps in health needs versus health demands/service utilization					Secure	GAVI HSS
To develop an IEC strategy that reflects national and programme specific health priorities in the context of community needs				National	Secure	MOPH
To pilot the IEC strategy in 4-5 provinces; access impact on household health and health seeking behaviour; and review IEC strategy accordingly				4 or 5 Provinces	Probable	MOPH
Strategic Area 2 NCD						
Develop and implement multi-year national strategy for NCD				National	Secure	WHO
Design and implement a capacity building plan for prevention and treatment of NCDs				National	Secure	WHO
To establish national NCD surveillance (pilot basis-national and three provinces)				National Level and 3 provinces in first two years	Not secure	
To conduct the survey of injury morbidity in rural and urban areas.					Not secure	
To develop national guidelines on injury prevention					Not secure	
To establish the basis for the national surveillance and monitoring system for injury and accidents					Not secure	
To conduct an assessment of current mental health service needs in DPR Korea					Not secure	
To pilot mental health case management system in 3 provinces and to create a model facility for mental health care in central mental hospital				National and 3 provinces	Not secure	
To ensure the quality of and adequate quantity of essential medicines for mental health care				Nationally	Not secure	
To strengthen elderly specializing sections to provide specialized and quality health services for elderly people (pilot basis)				Pilot sites	Not secure	
To collaborate with KFPD to identity and respond to health needs of the disabled.				Selected Counties in first two years	Secure	Partial funding through EU

IMPLEMENTATION PRIORITIES	2010	2011	2012	AREA	FUNDING STATUS	SOURCE
Strategic Area 3 CDC						
Maintain high coverage with aim to introduce new vaccines from year 2				Nationally	Secure	MOPH, GAVI, UNICEF/WHO
Develop local production capacity to reach the quality level of WHO standard for at least one vaccine.				National	Not secure	
Establish EPI database management system				Nationally	Secure	GAVI ISS
To implement operation research to identify need of strengthening the capacity of malaria program and reorientation of interventions taken to prevent malaria including IVM				Selected high risk provinces	Secure	GFATM
To strengthen comprehensive interventions to prevent malaria including IVM				Selected high risk provinces	Secure	GFATM
Strengthen analytical capacity of TB program at all level and resultant intervention reorientation				Selected high risk provinces	Secure	GFATM
Conduct initial survey for MDR-TB pattern				Nationally	Secure	GFATM
To make situational assessment HIV to reorient strategy and interventions from multi-year strategy plan				Selected provinces	Probable	GFATM, WHO
To plan and undertake a Hep B Survey to identify and standardize the interventions for mitigating current Viral Hepatitis epidemic.				Nationally	Not secure	
To establish integrated communicable disease surveillance system as per the international health regulation				Nationally commencing with pilot provinces	Probable	WHO
To intensify lab performance to the level of early detection of pandemic diseases for timely actions.				Nationally commencing with pilot provinces	Probable	WHO
Strategic Area 4 Womens and Childrens Health						
To strengthen the capacity of EmOC and ENC at the hospital level (incl. medical supplies and drugs) to scale up 20% by 2012				20% of counties by 2012	Probable	WHO
Strengthening referral care for high risk pregnancies (20%)				20% of counties by 2012	Probable	WHO
Capacity building for neonatal referral care especially on NICU in 2 provinces				2 Provinces by 2012	Probable	WHO
Development of standards for surveillance of RTI and provide proper diagnosis and treatment service at 2 provinces				2 Provinces by 2012	Secure	UNFPA

IMPLEMENTATION PRIORITIES	2010	2011	2012	AREA	FUNDING STATUS	SOURCE
To establish the breast and cervical cancer early detection system through mass screening				3 provinces	Not secure	
Training on IMCI and increase the IMCI introduction across the country including uninterrupted supply of essential drugs and equipment in 4 provinces/40 counties by 2012				4 provinces/40 counties by 2012	Probable	WHO
Strengthen the capacities of provincial pediatric hospitals at 4 provincial level by 2012				4 provincial levels	Probable	WHO
To implement child survival and growth monitoring strategy in all provinces and in pilot counties (every year 10% increase)				Increase 10% per year		
To implement programs on micro nutrient control among mothers and children				Nationally	Secure to 2012	UNICEF
Improve the inter-sectoral collaboration with education sector for dissemination of health information for adolescents					Not secure	
Strategic Area 5 Social and Environmental Determinants of Health						
To develop 5 year strategic plan for food safety					Probable	WHO
To strengthen the laboratory capacity of central food safety lab					Not secure	
To set up the correct norms and standards for the model units of good hygiene to motivate the community to create healthy environment by environment by encouraging them to reach standards of good hygiene					Not secure	
To conduct vulnerability assessment to consider the impacts of climate change on human heath in DPRK					Probable	WHO
Design a system of norms and standards for water and sanitation systems at public institutions					Probable	WHO
To conduct needs assessment of lab capacity at central and provincial level to build capacity for assessment of different environmental risk factors from different industries				National and provincial levels	Not secure	
To strengthen hospital waste management systems (assessment, guideline development)					Not secure	
Assess the capacity of health institutions for emergency response by the end of 2010.				Selected High Risk provinces	Probable	WHO
Conduct vulnerability assessment of epidemic and man made disasters by the end of 2010.				National and high risk provinces	Not secure	
Strengthen national institutional capacity to manage emergency situations by the end of 2011 (preparedness, response & mitigation: National, 2 provinces, 4counties & 8 Ris by 2010).				2 provinces, 4 Counties and 8 Ri	Not secure	
Develop early alert and warning system by 2011					Not secure	

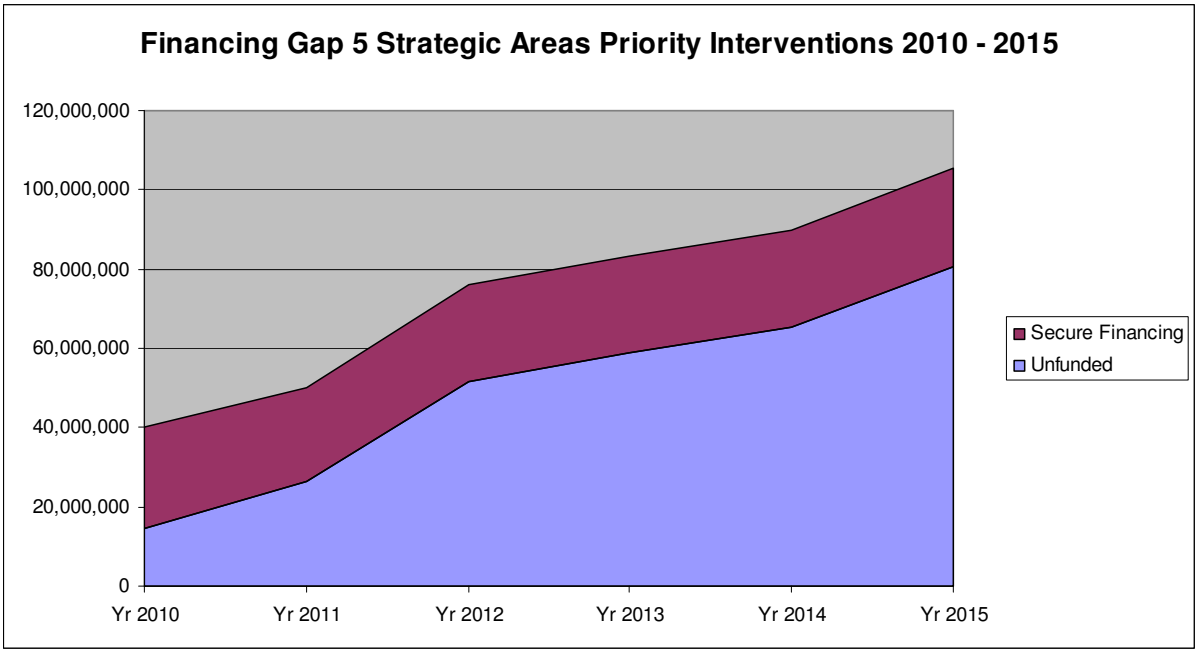
To provide adequate water and sanitation facilities at the 10 % of all health facilities by 2012	10% of all health facilities	Probable partial funding	EU
To strengthen the laboratory capacity of central food safety lab		Not secure	
Develop pilot healthy villages (100) to motivate good hygiene in the community	100 healthy Ri by 2012 and 2500 villages by 2015	Not secure	
Central food safety lab for 2012 and then eastern and western food safety lab centers will be created by 2015	Nationally	Not secure	

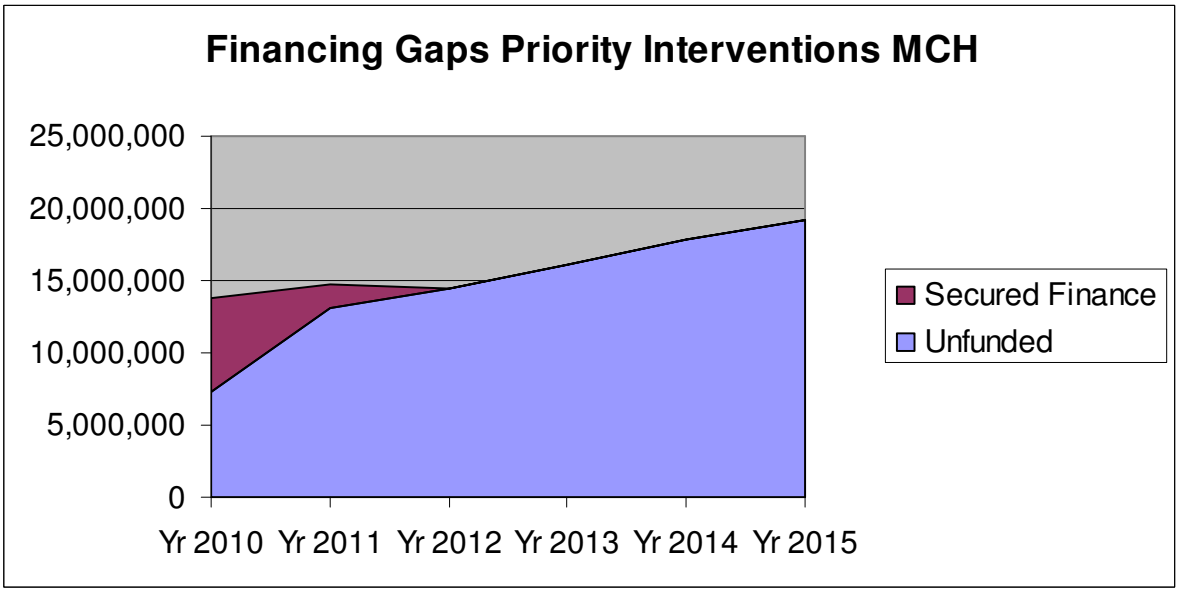
Annex 2 Expenditure Framework Priority Interventions 2010 – 2015

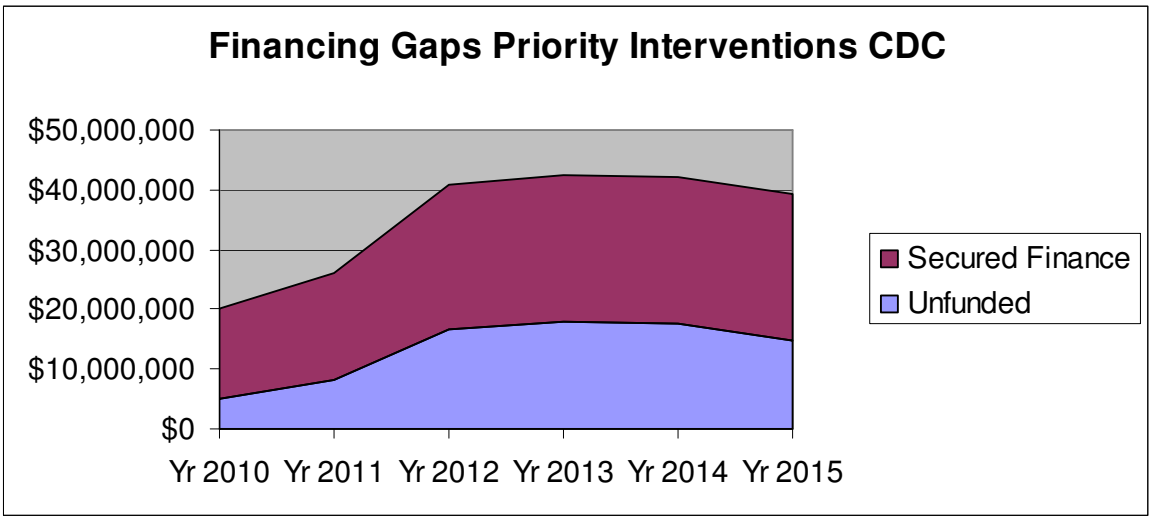
STRATEGIC AREA	COSTING							FINANCE	FINANCING GAP
	2010	2011	2012	2013	2014	2015	TOTAL	Total	
SA 1 HSS									
Policy and Planning	50,000	75,000	150,000	25,000	25,000	25,000	350,000	225,000	125,000
Health Planning and Information	25,000	50,000	50,000	25,000	25,000	35,000	210,000	75,000	135,000
HRD	250,000	500,000	1,000,000	1,000,000	1,000,000	2,826,333	6,576,333	2,425,000	4,151,333
Logistics & ED	25,000	50,000	25,000	75,000	0	0	175,000	0	175,000
Financial management	0	50,000	150,000	50,000	25,000	0	275,000	25,000	250,000
Service Delivery	4,790,000	6,415,000	15,096,000	15,646,000	16,146,000	26,978,000	85,071,000	2,000,000	83,071,000
Science & Technology	0	50,000	50,000	50,000	25,000	25,000	200,000	0	200,000
Community Participation	0	325,000	420,000	540,000	1,005,000	1,080,000	3,370,000	600,000	2,770,000
SUB TOTAL HSS	5,140,000	7,515,000	16,941,000	17,411,000	18,251,000	30,969,333	96,227,333	5350000	90,877,333
SA 2 NCD									
Chronic Diseases	0	0	0	165,000	220,000	515,000	900,000	0	900,000
Injury	0	0	25,000	155,000	235,000	793,333	1,208,333	0	1,208,333
Mental Health	0	0	50,000	600,000	1,625,000	2,890,000	5,165,000	0	5,165,000
Diability and Elderly care	1,050,000	1,050,000	1,050,000	2,225,000	2,300,000	2,600,000	6,825,000	0	6,825,000
Tobacco Control	0	100,000	50,000	50,000	72,083	100,000	150,000	0	150,000
SUB TOTAL NON CDC	1,050,000	1,150,000	1,175,000	3,195,000	4,452,083	6,898,333	$ 14,248,333	0	14,248,333
SA 3 CDC									
Immunization	5847574	8891121	21904569	21793708	22015549	16200549	96653070	62340474	34,312,596
Malaria	7,265,877	4,784,601	4,515,211	4,373,149	3,830,336	3,779,374	28,548,548	26507194	2,041,354

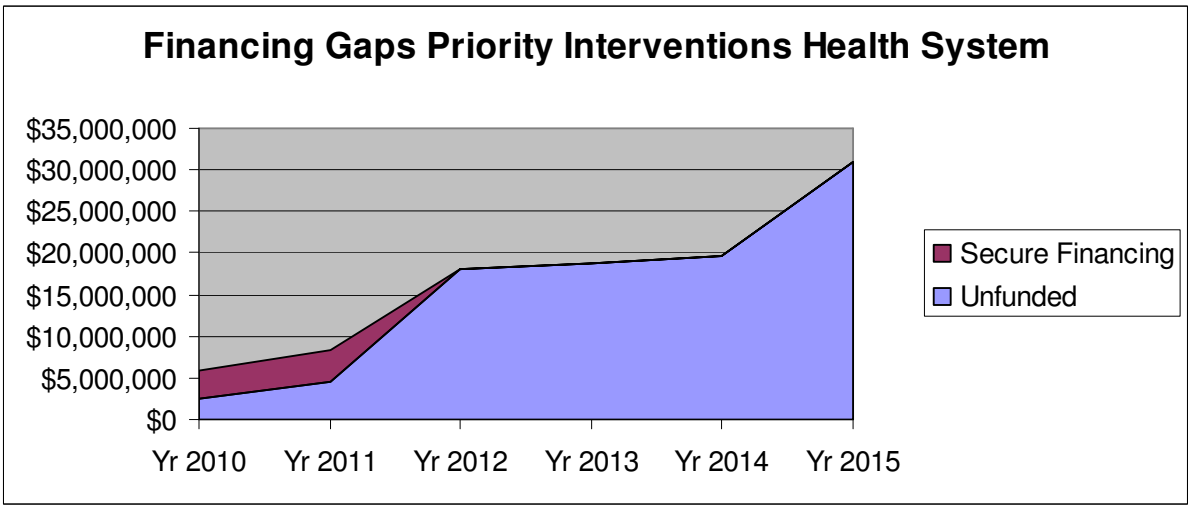
TB	7092195	7495580	7184978	7467414	7537908	7537908	44,315,983	44315983	0
HIV	0	5000000	7000000	8000000	8000000	11237260	39,237,260	0	39,237,260
Hepatitis B Treatment	0	0	0	35,000	40,000	10,000	25,000	0	25,000
Pandemic Planning	0	75,000	125,000	750,000	700,000	700,000	2,350,000	75,000	2,275,000
SUB TOTAL CDC	20205646	26246302	40729757.6	42419271.34	42123793	39465091.2	211,129,861	133238651	77,891,210
SA 4 MCH									
Maternal Health	10,775,000	10,932,500	10,932,500	11,770,000	12,805,000	13,135,000	70,350,000	6220000	64,130,000
Neo Ntatl care	150,000	150,000	100,000	200,000	400,000	600,000	1,600,000	150000	1,450,000
Reproductive Health	2475000	3225000	2800000	2900000	3100000	3425000	17,925,000	1250000	16,675,000
Child Health	150,000	150,000	250,000	225,000	200,000	257,000	1,232,000	0	1,232,000
Nutrition	2,346,000	2,346,000	2,346,000	3,100,000	3,100,000	3,200,000	16,438,000	4692000	11,746,000
Adoloescent Health	0	0	0	10,000	310,000	612,000	932,000	0	932,000
SUB TOTAL MCH	15896000	16803500	16428500	18205000	19915000	21229000	108,477,000	12312000	96,165,000
SA 5 SED									
Food Safety	0	0	25,000	945,000	1,720,000	1,720,000	4,410,000	0	4,410,000
Health/Hygiene Promotion	0	15,000	25,000	50,000	0	0	90,000	0	90,000
Climate Change	60,000	25,000	2,050,000	2,055,000	2,000,000	2,000,000	8,190,000	0	8,190,000
Safe Water and Sanitation	170,000	325,000	390,000	1,905,000	3,980,000	6,770,000	13,540,000	0	13,540,000
Healthy Living Conditions	0	0	25,000	45,000	85,000	45,000	200,000	0	200,000
Emergency Preparedness	75,000	95,000	120,000	120,000	170,000	320,000	900,000	0	900,000
SUB SED	305000	460000	2635000	5120000	7955000	10855000	27,330,000	0	27,330,000
TOTAL	27188574	33669621	57909069	62529708	68136549	79253883	$457,412,527	150900651	$306,511,876

Annex 3 Financing Gaps MTSP






Financing Gaps Priority Interventions CDC
$50,000,000
$40,000,000
$30,000,000
$20,000,000
$10,000,000
$0
Yr 2010
Yr 2011
Yr 2012
Yr 2013
Yr 2014
Yr 2015
Secured Finance
Unfunded


Financing Gaps Priority Interventions Health System
$35,000,000
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Yr 2010
Yr 2011
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Secure Financing
Unfunded

PLAN REFERENCES

[1] CBS UNFPA census 2010
[2] WHO Draft Country Cooperation Strategy page 10
[3] UNICEF Situation of Women and Children in DPRK 2008 page 12
[4] National Report of the DPRK to the 5th East Asia and Pacific Ministerial Consultation on Children, Beijing, May 2001 (in UNICEF 2008)
[5] Economic and Social Council United Nations Children's Fund Executive Board Second regular session 2006
[6] UNICEF Situation of Women and Children in DPRK 2008 page 17
[7] UNICEF Situation of Women and Children in DPRK 2008 page 12
[8] UNICEF Situation of Women and Children in DPRK 2008 page 16
[9] World Food Programme "8.7 million North Koreans Need Food Assistance" http://www.wfp.org/content/87-million-north-koreans-need-food-assistance [accessed August 22 2009]
[10] World Food Programme "8.7 million North Koreans Need Food Assistance" http://www.wfp.org/content/87-million-north-koreans-need-food-assistance [accessed August 22 2009]
[11] MOPH Annual Report of the Health State, DPR Korea, 2007
[12] DPRK Ministry of Foreign Affairs Pyongyang 15 October 2009 Letter relating to UNSF Strategic Prioritization Seminar
[13] UNICEF Situation of Women and Children in DPRK 2008 page 12
[14] MOPH Health Workforce Figures 2010
[15] Ri Yong Hwa Strengthening the Community Based Health Workforce in DPR Korea NIPA 2007
[16] Source of Information MOPH 2010
[17] WHO Strengthening Health Systems WHO Geneva
[18] WHO Primary health care, including health system strengthening SIXTY-SECOND WORLD HEALTH ASSEMBLY A62/8 Provisional agenda item 12.4 9 April 2009
[19] IHP 2008 International Health Partnership http://www.internationalhealthpartnership.net/
[20] IHP Joint Assessment of National Health Strategies and Plans Joint Assessment Tool: the attributes of a sound national strategy Draft July 2009 A companion set of Joint Assessment Guidelines, FAQ sheet and other materials, are at www.internationalhealthpartnership.net
[21] IHP Joint Assessment of National Health Strategies and Plans Joint Assessment Tool: the attributes of a sound national strategy Draft July 2009 A companion set of Joint Assessment Guidelines, FAQ sheet and other materials, are at www.internationalhealthpartnership.net page 2
[22] World Health Organization. International Health Regulations (2005). Geneva: The Organization; 2005. p. 1–74 [cited 2009 Sep 22]. Available from http://www.who.int/csr/ihr/en
[23] Source: Presentation MOPH National Health Sector Strategic Plan Meeting Pyongyang December 2009
[24] WHO COUNTRY COOPERATION STRATEGY page 11
[25] MOPH Revitalizing Primary Health Care Country Experience: DPR Korea Page 12-15 http://www.searo.who.int/LinkFiles/Conference_DPRK_15June-08.pdf
[26] WHO COUNTRY COOPERATION STRATEGY page 6
[27] WHO 2009 Health Statistics Report Geneva 2009
[28] MOPH GAVI HSS Proposal 2006
[29] MOPH GFATM Malaria Proposal 2009 page 14/68
[30] "Improving Women's and Children's Health in Democratic Republic of Korea: Framework for Multi-Year Assistance" WHO 2005.

[31] MOPH/WHO Women's and Children's Health Project 2008 - 2010
[32] UNFPA http://www.unicef.org/dprk/partners_233.html
[33] UNICEF DPRK http://www.unicef.org/dprk/health.html
[34] Data sourced from OECD website on development assistance http://www.oecd.org/countrylist/0,2578,en_2649_33721_25602317_1_1_1_1,00.html [Accessed on the web June 2007]
[35] Grundy J, R Moodie An Approach to Health System Strengthening in DPRK IJHMP page 10
[36] MOPH EPI Multi Year Plan for Immunization 2007 - 2011
[37] MOPH GAVI HSS proposal 2006
[38] MOPH/WHO Women's and Children's Health Project 2008 – 2010 page 11/27
[39] MOPH GAVI HSS Strategy 2006
[40] MOPH Annual Report of the Health State, DPR Korea, 2007 page 11
[41] MOPH/WHO Draft medium term Human Resource Development Plan
[42] UNICEF Situation of Women and Children in DPRK 2008 page 16
[43] WHO DPRK National Health Accounts Geneva 2009 http://www.who.int/nha/country/prk.xls
[44] MOPH Annual Report of the Health State, DPR Korea, 2007 Page 13
[45] MOPH Draft Financial Sustainability Plan 2003 page 14
[46] UNICEF .2006. MOPH.2006.op. cit. WHO. 2005.op. cit. 2005
[47] MOPH. 2006 a op.cit.2006
[48] MOPH Rd 8 GFATM Proposal 2009
[49] MOPH Annual Report of the Health State, DPR Korea, 2007
[50] Nossal Institute for Global Health Evaluation of Women and Children's Health project 2007
[51] MOPH/WHO Women's and Children's Health project 2008 – 2010 Page 27
[52] WHO.2003. WHO Country Cooperation Strategy 2004-2008 WHO Pyongyang 2003
[53] WHO, 2006, "Capacity Building in the Public Health Sector" Proposal to UNDP WHO Pyongyang
[54] Economic and Social Council United Nations Children's Fund Executive Board Second regular session 2006 6-8 September 2006 Item 4 of the provisional agenda* Country programme document**
Democratic People's Republic of Korea
[55] Central Bureau of Statistics, UNFPA Reproductive Health Survey in DPRK May UNFPA, 2005.
[56] UNICEF, op.cit, 2006
[57] Nossal Institute for Global Health Evaluation of Women and Children's Health project 2007
[58] WHO SEARO Health Situation in the SEARO Region 2007
[59] Ri Yong Hwa Strengthening the Community Based Health Workforce in DPR Korea NIPA 2007
[60] Ri Yong Hwa Strengthening the Community Based Health Workforce in DPR Korea NIPA 2007
[61] MOPH 2007 The State of Health in DPRK MOPH Pyongyang
[62] See WHO 2006 World Health Report Geneva 2006 for updated assessment of health workforce population ratios. http://www.who.int/whr/2006/en/ [accessed July 2007]
[63] WHO. 2004.op. cit.
[64] MOPH GAVI Health System Strengthening proposal 2006
[65] MOPH Rd 8 GFATM Proposal 2009
[66] National Institute of Public Health Administration /Nossal Institute Baseline Survey Report: Improving Women's and Children's Health in DPR Korea Project 2009
[67] GOVERNMENT OF DPRK, UN SYSTEM, Partners in Health and Nutrition BOTTLENECK ANALYSIS WORKSHOP Pyongyang 10-11 February 2009
[68] WHO COUNTRY COOPERATION STRATEGY page 6
[69] MOPH DPRK Annual Report of the State of Health 2007 MOPH Pyongyang

[70] WHO SEARO DPRK profile http://www.searo.who.int/LinkFiles/DPR_Korea_CHP-DPRK.pdf
[71] MOPH Annual Report of the Health State, DPR Korea, 2007
[72] MOPH Annual Report of the Health State, DPR Korea, 2007 page 26
[73] WHO SEARO DPRK profile http://www.searo.who.int/LinkFiles/DPR_Korea_CHP-DPRK.pdf
[74] MOPH Revitalizing Primary Health Care Country Experience: DPR Korea Page 9 http://www.searo.who.int/LinkFiles/Conference_DPRK_15June-08.pdf Page 11
[75] MOPH Annual Statistics Report 2007
[76] WHO COUNTRY COOPERATION STRATEGY Page
[77] MOPH Revitalizing Primary Health Care Country Experience: DPR Korea Page 9 http://www.searo.who.int/LinkFiles/Conference_DPRK_15June-08.pdf page 10
[78] Govt. of DPR Korea The law of DPR Korea on the Protection of the [person with disability
[79] WHO SEARO Health Situation in the SEARO Region 2007
[80] MOPH Revitalizing Primary Health Care Country Experience: DPR Korea Page 9 http://www.searo.who.int/LinkFiles/Conference_DPRK_15June-08.pdf page 11
[81] Data sourced from MOPH Rd 8 Global Fund proposal and (2) MOPH Multi Year Strategic Plan TB Prevention and Control 2010 – 2015
[82] Data sourced from MOPH Multi Year Strategic Plan TB Prevention and Control 2010 – 2015
[83] MOPH TB Rd 8 proposal Page 53
[84] MOPH National Strategic Plan on HIV/AIDS Prevention and Control DPRK (2008 – 2012)
[85] CBS reproductive Health Survey 2006
[86] National Malaria Control Strategy (2009-2013) DPR Korea 2008
[87] MOPH Revitalizing Primary Health Care Country Experience: DPR Korea Page 9 http://www.searo.who.int/LinkFiles/Conference_DPRK_15June-08.pdf
[88] MOPH Global Fund Proposal Malaria Rd 8 Page 14/68
[89] MOPH Annual Report of the Health State, DPR Korea, 2007 page 51
[90] MOPH Medium term EPI Plan 2007 - 2011
[91] MOPH/UNICEF National Immunization Coverage Survey 2008
[92] WHO SEARO Health Situation in the SEARO Region 2007
[93] WHO SEARO Health Situation in the SEARO Region 2007
[94] MOPH/UNICEF National Immunization Coverage Survey 2008, Joint Report Forms, WHO data base on immunization
[95] WHO / UNICEF Joint Report Form EPI 2009
[96] MOPH Financial Sustainability Plan for Immunization 2003
[97] MOPH GAVI Annual progress Report 2008
[98] MOPH Strategic Work plan For The Prevention And Control Of Hepatitis B Disease In The Democratic People's Republic Of Korea 2009 - 2013
[99] UN Common Country Assessment 2002
[100] UNICEF Situation of Women and Children in DPRK 2008 page 18
[101] National Nutrition Survey 2004
[102] Source: national Nutrition Surveys, as recorded in UNICEF Situation of Women and Children in DPRK 2008 Page 33 and including updated data from MICS survey 2009
[103] UNICEF MICS 2009
[104] CBS National Nutrition Assessment 2004 Page 8
[105] National Nutrition Survey 2004 reported in UNICEF 2008 Page 35
[106] UNICEF Goitre Survey
[107] UNICEF MICS
[108] UNICEF MICS 2009
[109] UNICEF page 69
[110] CBS National Census 2009 DPR Korea UNFPA

[111] Nossal Institute for Global Health External Evaluation Improving Women's And Children's Health In DPRK 2008
[112] CBS Pyongyang Reproductive Health Survey 2006
[113] CBS Pyongyang Reproductive Health Survey 2006 Page 45
[114] CBS Pyongyang Reproductive Health Survey 2006 page 62
[115] Grundy J, Moodie R An Approach to Health System Strengthening in DPRK International Journal of Health Management and Planning 2008 page 10
[116] Nossal Institute for Global Health External Evaluation Improving Women's And Children's Health In DPRK 2008 Page 20
[117] MOPH National Reproductive Health Strategy: 2005-2010, Second Draft, August 2005, Reproductive Health Taskforce DPRK, Ministry of Public Health.
[118] MOPH/WHO Women's and Children's Health Project 2008 – 2010 page 11/27
[119] Economic and Social Council United Nations Children's Fund Executive Board Second regular session 2006 6-8 September 2006 Item 4 of the provisional agenda* Country programme document**
Democratic People's Republic of Korea
[120] WHO World Health Statistics 2008 WHO Geneva www.who.int [accessed on the web May 23 2008]
[121] CBS National Census 2009 DPR Korea UNFPA
[122] UNICEF Situation of Women and Children in DPRK 2008 page 37
[123] UNICEF Situation of Women and Children in DPRK 2008 page 66
[124] Economic and Social Council United Nations Children's Fund Executive Board Second regular session 2006 6-8 September 2006 Item 4 of the provisional agenda* Country programme document**
Democratic People's Republic of Korea
[125] See MICS study UNICEF for latest figures
[126] Economic and Social Council United Nations Children's Fund Executive Board Second regular session 2006 6-8 September 2006 Item 4 of the provisional agenda* Country programme document**
Democratic People's Republic of Korea
[127] Nossal Institute for Global Health External Evaluation Improving Women's And Children's Health In DPRK 2008 Page 2
[128] MOPH/WHO Women's and Children's Health Project 2008 – 2010 page 13/27
[129] MOPH/WHO Women's and Children's Health Project 2008 – 2010 page 11/27
[130] Strategic framework for cooperation between the United Nations and the Government of the Democratic People's Republic of Korea 2007-2009 Page 10
[131] Strategic framework for cooperation between the United Nations and the Government of the Democratic People's Republic of Korea 2007-2009
[132] Inter Governmental Panel on Climate Change 3rd Assessment on Climate change (Asia) 2007
[133] Vijapuri S WHO Water and Sanitation Consultant Report Pyongyang 2009
[134] Vijapuri S WHO Water and Sanitation Consultant Report Pyongyang 2009 Page 6
[135] WHO COUNTRY COOPERATION STRATEGY page 13
[136] Strategic framework for cooperation between the United Nations and the Government of the Democratic People's Republic of Korea 2007-2009 page 14
[137] CBS MICS Study 2000 http://www.childinfo.org/files/dprk.pdf Page 30
[138] CBS MICS Study 2000 http://www.childinfo.org/files/dprk.pdf Page 31