

Transport services in the Maldives – an unmet need for health service delivery

Maimoona Aboobakuru⁶

Abstract

The article aims to look at the use of transportation in the delivery of health services in the Maldives. Being a small island nation with thousands of tiny islands scattered in a vast area of sea, transportation is an important factor for equitable access to services. Providing services to a great majority of islands with small population sizes has proved challenging and resource intensive. The diseconomies of scale, and retaining and sustaining the health-care work force have continued to be major challenges.

The government of Maldives stayed committed to improving the health situation and the steady focus it has given to maternal and child health fared well for the overall health development. The maternal death review process initiated in the 1990s and efforts to improve on the process resulted in addressing specific care related needs. Maldives achieved the Millennium Development Goals (MDG) 4 and 5 well ahead of the targeted time frame. The Maternal Mortality Ratio (MMR) declined from a high of 500 per 100,000 live births in 1990 to less than 50 per 100,000 live births at present.

However, the lack of an organized public transport system increased the burden for the equitable provision of health care and was a setback to the 4-tier referral health care delivery system. The health sector approach of mobile outreach did not prove sustainable due to the high cost of maintenance and therefore continued with increased diseconomies of scale in providing health care to the sea locked small populated communities.

Keywords: public health, transportation planning

1. Introduction

1.1 Brief profile of the country

Located in the Indian Ocean 600 km south of the Indian sub-continent is the archipelago of the Maldivian Islands (Figure 1). It consists of 1192 tiny coral islands that form a chain stretching 820 km in length and 120 km in width. These islands cover a geographical area of approximately 90,000 square kms of which land area comprise only 300 sq kms. The islands form 26 natural clusters (atolls) which are grouped into 20 administrative atolls. The islands are surrounded by varying levels of sea and access to the islands is by the sea route. The islands and the atolls are mainly connected by boats.

With a population growth rate of 1.7% based on the latest estimates from the 2006 census, the Maldives has passed three phases of demographic transition (Ministry of Planning and National Development, 2008). The high stationary stage where birth rates and death rates were high prevailed through the 1960s (Figure 2). Death rates started to fall with the introduction and establishment of organized health care services under the primary health care approach. The 1970s and a major part of the 1980s saw a rapid increase in population growth. Total Fertility Rate (TFR) remained high at around 6 to 7 children per women during the period. A family planning programme was initiated in the early 1980s and rolled out to the islands throughout the country. TFR fell to 5.4 children between 1995 and 2000. Currently, the TFR is at 2.5 children (Maldives Demographic and Health Survey, 2009).

⁶ Director, Public Health Programs, Health Protection Agency, Ministry of Health and Gender, Maldives. Email: maimoona.aboobakur@gmail.com

Figure 1. Map of Maldives

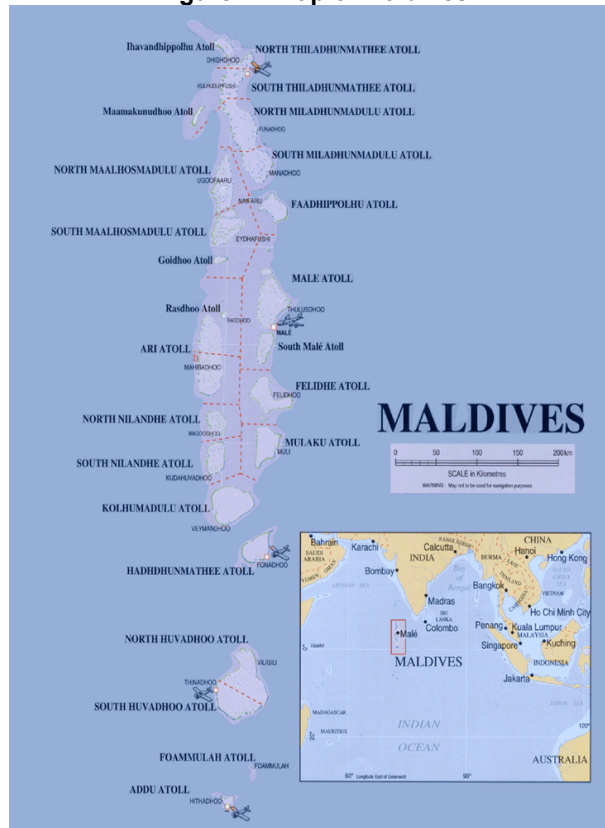
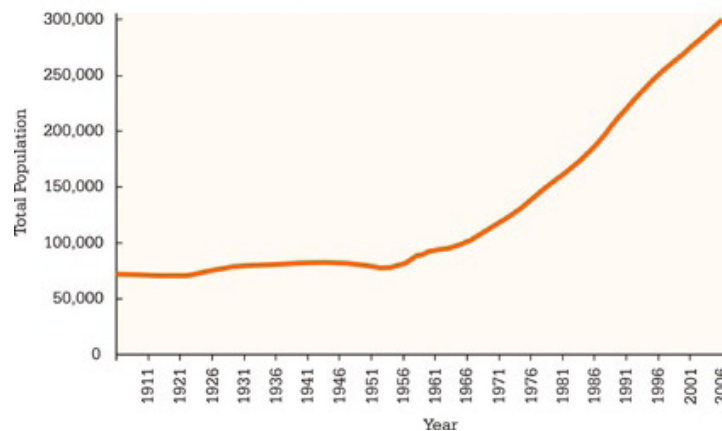


Figure 2. Population of Maldives 1911-2006



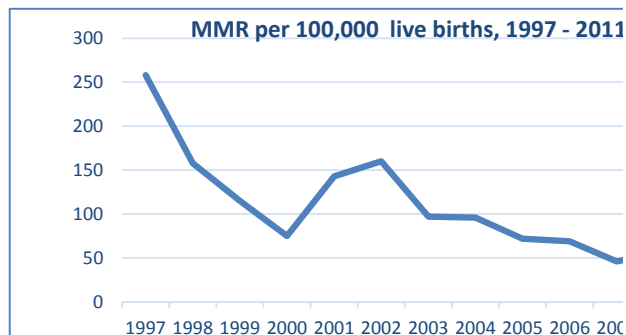
Source: Population and Housing Census, Maldives (2006)

Remarkable progress has been achieved in the health status of Maldivians during the past few decades. Life expectancy at birth rose from a low of 50 years in 1980 to 70 years by 1995. From the early 1990s female life expectancy was noted to have increased slightly. Currently the female life expectancy has reached 75 years while that of males stands at 73 years (Ministry of Health, 2012). Child mortality declined four folds between 1990 and 2010. Currently, under five mortality and infant mortality stand at 11 and 9 per 100,000 lives respectively. The MDG target for child mortality was reached about 10 years ahead of the target date. Maternal mortality, though at a slower rate, also fell from 257 per 100,000 live births in 1997 to 57 per 100,000 live births in 2011 (Ministry of Health, 2012).

1.2 Maternal health and maternal health care services

Maldives was one of the first countries in South Asia to achieve MDG 5. Significant improvements in maternal health have been seen over the years. This is evident from the falling rates of maternal mortality. Maternal mortality in 1990 was recorded at 500 per 100,000 live births. The MDG target for reaching MMR of 125 per 100,000 live births was achieved by the early 2000s (Figure 3). Access to health services improved. The antenatal care (ANC) coverage has been raised to 90% of pregnant women making their first ANC visit during the first trimester and 85% of women having had 4 or more antenatal check-ups (Ministry of Health and Family, and ICF Macro, 2010). Almost all women (99%) received antenatal care by a skilled birth attendant.

Figure 3. Maternal mortality ratio per 100,000 live births, 1997-2011



In the Maldives, 95% of the deliveries occur at health facilities and thus, 95% of births are attended by a skilled provider (Skilled provider includes gynaecologist, doctor, nurse midwife or community/family health worker). Such improvements have been the result of the government's commitment for providing access to better services as well as the socioeconomic development that has occurred during the past few decades. The total fertility rate that stood at around 6 children in the early 1980s has fallen to 2.5 children in 2009. The patterns of age-specific fertility rates (ASFR) have shown increased age of child bearing. The ASFR peak of 20-24 years in the year 2000 increased to 25-29 years in 2006 (Ministry of Planning and National Development, 2008). Equal opportunities for men and women for education and other social development policies have led to the improvement in the maternal health situation. Women fared better in the achieved literacy rates and are therefore better oriented in health awareness and health care seeking.

Maternal and child health (MCH) has always been given high priority within the health care set-up. Maternal health services are organized under the 4-tier health care delivery system. Services are provided at all levels within the MCH and reproductive health services. Antenatal care and basic obstetric care is available at the lowest level (island level) health centers most of which are manned by a medical officer, nurses and community health workers. The second level (atoll level) includes emergency obstetric care services and serves as the first referral to the island level. Regional hospitals in 6 strategic locations in the country are the 3rd referral facility where more specialty services are available. Tertiary level services are available at the central level hospitals in Male, the capital city of the Maldives.

Maternal health services are provided free and even after the implementation of the universal health insurance scheme, the policy is not to charge for these services in the allotted insurance premium.

1.3 Objectives

This report is aimed at analyzing the use of transportation in the delivery of health services in the Maldives. Maldives being a maritime nation whose territory is 90% water, people of the Maldives highly depend on sea transport for accessing services as well as trading goods and other commuting needs. In the absence of an organized public transportation system, the health sector of the Maldives has invested in extending health care services to the remote but very small communities, resulting to high diseconomies of scale.

Information compiled in this article is based on review of available documentation, service records and information gathered through interviews carried out with experienced personnel who have worked in the health sector, specifically in the maternal and reproductive health services. The personal experience of the author who has been in the planning and implementation of health care services and has been involved in the monitoring of health care situation was an added advantage. At the same time, the non-availability of documentation on management of health care services is a limitation for bringing out a better picture of the health services situation.

2. Factors and related interventions contributing to recent reduction in maternal deaths

Health care services began to be established at various parts of the country in the 1960s. Prior to this health care was only available at a small hospital established in Male with a couple of doctors and a few nurses. The island communities lived a very remote and isolated life confined to their closed community. Remedies to ailments were provided by the local healers who practiced traditional medicine. Health care in the atolls was first established with the construction and equipping of a small health center facility in a few islands targeted for high populated areas. Health services gradually expanded to all parts of the country and today health center facilities are available in all inhabited islands. Following are the most probable factors and service developments that have contributed the most to the improvement of maternal health and subsequently lower maternal mortality.

2.1 Midwifery service and training

At the time when very few of these facilities were delivering health care, antenatal and maternal health care was provided by the traditional birth attendants (TBAs) who were always a frequent friendly visitor to families and homes. These TBAs were provided with delivery kits with minimal tools for a clean home delivery in the early 1970s, and were given instructions on how to use them. A training programme for the TBAs was initiated shortly after, conducted by teams travelling to locations close to the trainees. A formal 6 month training course was developed later and TBAs from across the country were trained in batches. The trained TBAs were later employed by the government as bonus for service continuity. TBAs were trained on the basis that every 500 population is served by at least one.

Prior to the development and improvement of atoll level health facilities, training for community health workers included a strong midwifery module. The community health workers managed the health center facilities and played a supervisory role for the TBAs and family health workers. With the development of regional hospitals and service expansion of health center facilities midwifery nursing took priority position in the human resource development policy of the government. Diploma level nursing training was established in the country in 1990 with compulsory midwifery component. Nurse midwives were deployed to island level health care centers and today most health centers are manned with nurse midwives.

2.2 Organization of referral health care mechanism

The community level based health care workers were to follow strict referral protocols. The TBAs were well instructed for early referral with indication of high risk and possible complications. Referral to higher centers means people have to cross sea to follow and comply. Referral was not easy due to the unavailability of an organized public transportation system. The referral mechanism was highly dependent on the availability of a boat and the willingness of the owner to make the trip. The difficulty eased as transportation needs for trade and other commuting needs of the people grew. The operation of the regional airports led to the operation of hired and paid transportation in the islands. Mechanized boats and speed launches that cater for airport transfers were useful for health care referrals.

The referral health care organization gradually resulted in the government facilitating the availability of vehicles of high speed capacity to every hospital in the atolls. The regional hospitals do not only wait to receive referral cases but also acted as an outreach service center that caters to the needs of the surrounding atolls and islands. Regular mobile team activities are conducted by community health care workers for immunization, health screening activities, including maternal and child health programmes, and health awareness activities. Each regional hospital is given the

responsibility of taking care of 2-3 designated atolls in the vicinity. The referral system prescribes all lower level health facilities in the region to report and take advice from the hospital and it is the regional hospital that would make arrangements and facilitate referrals that require help beyond the services available in the locality.

2.3 Expansion and strengthening of emergency obstetric services

Since obstetric emergencies are the main and most common emergencies, it was the emergency obstetric care that became the hub of the strengthening and expansion of services at the atoll level health care facilities. Emergency obstetric care was extended to the atoll population through the establishment of regional hospitals. The first regional hospital located in the far north of the country began its services in 1982. Development of regional hospital level facilities in other parts of the country followed suit shortly after and a total of 6 regional hospitals at strategic locations were functioning by end of 1990s. Each of the regional hospitals served a catchment area of 2-3 atolls and operated as the referral center for secondary level health care. Gynecology and obstetrics was the first specialty services provided at these facilities. Today the regional hospitals offer additional specialty care services.

Very early on the atoll level health center facilities provided basic obstetric care. Based on the size of the population the island level health post facilities were upgraded to health center level in additional islands of the atoll. The main health center facility which serves as the first referral point was located in the capital island of the atoll. The development today is that each island has a health center facility with capacity to provide basic obstetric care, manned by a medical officer, nurses and community health care workers.

Another major development to extend emergency obstetric care happened in the early years of 2000s. All health center facilities at the atoll capitals were upgraded to atoll hospitals targeting the provision of emergency obstetric care as well as new-born care. Thus gynecology and obstetrics and pediatric services were made available at closer proximity for the atoll population. Today, all atolls are equipped with at least an atoll hospital facility.

2.4 Standards for maternal and reproductive health care

Maldives is a country where majority of the medical professionals and other paramedics are expatriates who are usually in service for a short period of 1-2 years. Due to this high turnover of service providers, maintenance of service standards has to be given special attention. Service protocols and standard operating procedures, maternal and child health as well as reproductive health had been among the first developed. Written and printed protocols on ante-partum, intra-partum care are provided to all health facilities. However, the challenge of effective enforcement of the proper use of these protocols still remains. Training programmes and orientation sessions are conducted from time to time for in-service capacity building.

2.5 Monitoring of services and maternal mortality reviews

The maternal and child health (MCH) programme also pioneered the conduct of regular and close monitoring of services at all levels. In early 1990s, a reporting mechanism was initiated by the MCH programme to centrally monitor high risk pregnancies. When the TBAs became employees of the health care facility in their respective islands, health facilities started to keep records of pregnant women treated at the facility. The TBA, with the help and guidance of the family health workers, maintained these records. This helped the health facility keep track of the pregnant women and to make arrangements for scheduled visits. The TBA and the family health workers in the island conducted regular monitoring visits to all pregnant women. They made sure that all pregnant women are registered and that they follow the check-up schedules that they are given. This was not difficult for most of the health workers since they had to look after a small and manageable population size. Monthly reports are sent to the central level via the main atoll health facility. The atoll health facility is given the responsibility of leading any assistance required and to give advice. The central level monitoring enabled good and attentive provision of care at the local level.

During early 1990s, a maternal death auditing process was initiated in order to identify the causes and to reduce the preventive causes of maternal mortality. The auditing process that began

with a self-completed pro forma was taken over by a more comprehensive active maternal death auditing process that began in 1997. Since then all maternal deaths are notifiable and all health facilities are obliged to send in a report on the maternal death within 24 hours of occurrence. A maternal death review committee comprised of a senior gynecologist, physician, nurse midwife, representative from the MCH/reproductive health programme, representative from the health services management and representative from Health Management Information Systems (HMIS) was formed in the year 2000. The committee sits and reviews each single maternal death upon receipt of the reports from the place of occurrence. If additional information or documentation is required further enquires are made. After ruling out the possible cause of death, corrective action is recommended by the committee which is passed on to health facilities and the relevant authority for implementing the committee's recommended corrective action. Since the implementation of the death review process, the Maternal Mortality Ratio (MMR) dropped from 257 per 100,000 live births in 1997 to 46 in 2007 (Ministry of Health, 2013). Although fluctuations are seen in the annual trends due to the small ratio, there has been steady decline in MMR, which can be attributed to the close monitoring efforts and death reviews. A recent development in such monitoring for the improvement of maternal health services is the review being initiated on near misses of maternal mortality.

3. Role of transport services and costs

3.1 The transport systems in Maldives

The main modes of transport in the country are by sea and air. Need for land transport is minimal as most of the islands are very small. Almost 70% of the islands are less than 1 square km in size. All commuting between islands are dependent on sea transport. Having about 90% of the country's territory covered by sea, development of marine transport is vital to the country's economy.

3.1.1 Types and organization of sea transportation

The mechanization of sea transport vessels during the first half of 1970s was a breakthrough in the development of transportation in the Maldives. Prior to that, the commonest mode of commuting by the island communities was the sail boat, which today is used as a luxury sporting facility in the tourism industry.

The types of sea transport include mechanized locally constructed boats, speed boats and launches (Table 1). Most commonly used sea vessels are the wooden mechanized boats majority of which are fishing vessels. These are locally called 'dhoanis'. The Transport Authority of Maldives records a total of 6,293 dhoanis registered at the end of 2011 (Transport Authority of Maldives, 2014). The speed of these boats varies depending on the size as well as the capacity of the engine. Second in line are the fast speed launches of varying sizes used to carry people from place to place. While dhoanis are used for travel inter island in the locality for lower prices, the launches are mainly attached to tourist resorts for the transfer of tourists between airport and resorts. By the end of 2011, there were 2,083 launches in operation (Transport Authority of Maldives, 2014). The third and fourth types of vessels for people's travel are the 'boats' and 'baththeli', which are much larger in size and are the cargo-cum-passenger transport vessels built for long distance travel. These are the main means of commuting between atolls that are far from the capital city, for trading goods and other transport needs.

Table 1: Types of vessels for sea transport in use, 2011

	CATEGORIES	Number
1	Dhoani	6,293
2	Launch	2,083
3	Boat	521
4	Baththeli	155
5	Barge	130
6	Tug	32
7	Landing Craft	50

	CATEGORIES	Number
8	Dredger	5
9	Bokkuraa	1,234
10	Yacht	129
11	Catamaran	3
12	Manavaru	1
13	Jet Ski	1
14	Glass Bottom Boat	1
15	Passenger Ferry	2
16	Others	7
TOTAL		10,647

Source: Maldives Transport Authority (2011)

The 'bokkura' which takes the third place in number is a small dingy type dhoani used for loading and unloading goods and in some situations, people from the vessels to the shore or jetty. Since most of the harbor areas in the islands are shallow waters, the vessels have to be anchored further away from the jetty and these small boats are then used. These are also used for inter-island travel between nearby islands as well as for reef fishing.

3.1.2 Maritime transportation services

Regular and scheduled transport is rare in the case of maritime travel. Most of the sea transport services are privately organized and made available for hire and at the owner's convenience. Private boat owners operate the cargo-cum-passenger boats for travel between a particular atoll and Male. These travelling arrangements are quite popular and due to high demand it is found to be routine and frequent for larger islands. Based on demand and the population size, these operators make arrangements to stop over at other atolls along the route. Other islands only have the choice of early booking for travel and making their own arrangements to catch the boat in good time, which may involve hiring of locally available transport and arranging for accommodations at the place of departure.

a) Island Ferry Services, a recently initiated intra-atoll transport system

Some island communities, particularly few closer to Male, operate privately-owned regular ferry services for their commuting needs, such as trade, shopping, and health care. These island ferry services are usually scheduled once or twice a week. On a public private partnership basis, a transport network was initiated recently where interested operators were invited. Thus, a ferry transport system operating separately in each atoll was started in 2009/2010 by different operators. However, due to several management and other resource lags, the inter-island ferry services could not continue as intended. Only a few atolls currently operate the service.

b) Ferry services in greater Male

Regular and frequent ferry service is organized between Male and two nearby islands that are inhabited by the population in Male, the islands of Villingili (Villimale) and Hulhumale. The ferry service between these islands and Male is the means of transport for people who commute daily for work, school and other purposes. This ferry service is operated by the public company, the Maldives Transport and Contracting Company plc (MTCC). The MTCC which formed in December 1980 has been the first public company in the Maldives. It offers a multitude of services which include modern transport services, logistics operations, construction and project management services, and serves as a major vendor of reputed brands of heavy machinery, marine engines, compulsion systems and lubricants (Maldives Transport and Contracting Company (MTCC), 2014). The MTCC also operates occasion based launch ferry services to other parts of the country in addition to launches for hire.

c) Airport ferry service

The ferry service between Male and the airport is the longest established ferry service in the country. As the airport in the Maldives is located in a geographically separate island (Hulhule), the only transport means to access the airport is by sea.

Ferry services between Male and Hulhule, and Male and Hulhumale, now include an express ferry service by speed launches.

More organized system of sea transport in the Maldives is found to be associated with the development of air transport and the tourism industry. This is basically linked to the transfer of passengers to and from airport catering to both locals and tourists. These transport services are operated by private boat owners and resort owners in collaboration with the government owned Airports Company.

3.1.3 Air transportation

Regular air transport has been operating in 4 locations for the past couple of decades and has now expanded to 9 locations. The Island Aviation Services Ltd, a limited liability company established in April 2000 under a Presidential Decree, serves as the main operator of local air travel and the local airline, the 'Maldivian' (Maldivian maldivian.aero, 2014). The airline began international flights in January 2008, operating to nearby destinations in India and Sri Lanka. Two other companies, Villa Air and Mega Maldives now operate to select locations in the country as well as a few international destinations.

In addition, two companies, the Maldivian Air Taxi (PTE) Ltd and the Trans Maldivian Airways operate sea planes that cater to tourist resorts. Air travel is popular but quite expensive and travel by air has to be always accompanied by sea travel except for those residing in the island where the airport is located.

Airport transfers for the local community in the atolls is mostly hired transport since there are no regular ferry service available in the atolls similar to that found in Male. Limited access to air taxi service is available to locals in areas where they operate, subject to availability of seats after serving the tourist transfer needs.

3.1.4 Land transportation

The need for land transportation for everyday commuting is minimal in the Maldives. Except for a few islands, the land area of islands is very small – most of them are less than a square kilometer. Land transport vehicles are found in the capital island, Male. The island is around two and half kilometers in land area and is full of land vehicles, the commonest of which are motor-bikes. As of end 2011, the Transport Authority of Maldives records 51,631 land vehicles of which 42,062 are motor-bikes (Transport Authority of Maldives, 2014). Taxi cars and the recently started mini bus service are the public land transport services in Male. Taxi services are also available in other large islands.

3.1.5 Transport development and regulation

The Ministry of Transport and Communication has the overall responsibility for matters relating to transport and communication in the country, including the formulation of environment friendly and safety procedures, and regulation pertaining to aviation, shipping and maritime industry, land and sea transportation (Ministry of Transport and Communication, 2014).

a) Transport Authority of Maldives

The Transport Authority of the Maldives has the key function of regulating and promoting the development of maritime and land transport sectors in the Maldives. It also takes the role of setting policies to mitigate the negative impact of transport on the environment, as well as setting vessel and vehicle safety standards and implementing land and maritime regulations. The authority provides registration services for vehicles and vessels, issues driving licenses, roadworthiness and vessel

safety certificates, and promotes and issues certification for the Maldivian Seaman.

b) Civil Aviation Authority of Maldives (CAA)

The Civil Aviation Authority has the responsibility for the development and administration of policies and regulations to ensure safety, security, order and development of aviation in the Maldives. It develops national safety standards that are in compliance with international aviation standards and implements economic and safety regulations through the regulation of airports, air traffic services and airlines.

3.2 Transport operation experience of the health sector

Sea transportation is an independent factor for the provision of equitable health services in the Maldives. The government of Maldives organized provision of basic primary health care in every inhabited island of the country, irrespective of the size of the population to be served.

From the beginning of health care development, the services depended on transport assistance made available by occasional donor assistance and government led small-scale projects. In 1961, the British government donated a launch with sea ambulance facility which was used in the south of the country. During the year 1970, the government and UNICEF signed a memorandum of understanding for providing and operating health launch services for health care facilities in the atolls. In 1973, three such launches were provided to three health center facilities in the north of the country. The project did not materialize as anticipated. With the allocated funds for the project, the government tried developing mechanized speed boats at lower cost and provided these to the health center facilities in 1978. A major challenge was the maintenance of these vehicles.

The Ministry of Health received two launches as donation by the Lebanese government in 1980 to be utilized for travelling between the central level and other islands. Due to the maintenance difficulties and lack of resources in the health sector, the launches given out to the atoll level hospitals were handed over to the atoll administrative offices that have better operational capacity than the health facility. As the maintenance and other operational expenses were borne by the atoll offices, its availability for health sector use had been limited. By 1990, most of these launches were unusable.

Due to the pressing transportation needs of the hospitals, in 2005 the Ministry of Health through another government funded project again started providing speed launches to all regional hospitals and atoll hospitals covering all atolls. These have been used for outreach activities and other travelling needs of the hospital as well as for transfer of patients, with a subsidized charge levied on the families. With the attempt of the government that came to office in 2008 to corporatize the health care services, their use was not monitored by the Ministry of Health. Health care facilities were de-corporatized in 2012 and the launches were back in the control of the Ministry of Health. The latest development was the handing over of these launches to the National Defence Force by the new government that came to office in 2013 to facilitate proper maintenance of the vehicles.⁷

3.3 Transport challenges for patients seeking access to services

Until recently, there has not been an operational public transportation system in the country. As a pledge of the previous government, efforts were made to establish a public transportation mechanism in the country where it contracted out the provision of ferry service in each atoll.

To access health care not available locally, the islanders have to depend on private boat owners. Boats available in the islands are either fishing vessels or boats used for transport of goods and passengers between Male and islands. There are few high speed private launches also available in most of the atolls. For attending to referrals to higher levels of care as well as for seeking better health care within the atoll and within the region, people have to either hire available transportation at a rate or pay fuel costs for the travel. When and where only fishing vessels are available, people have to wait for the time when these boats are not out fishing, which usually falls on the weekend.

⁷ The information here is an outcome of interviews carried out by the author with personnel and colleagues at the Ministry of Health who worked in various health programme areas. The information also represents reports and records in the Ministry of Health.

For quick and more convenient travel, people who can afford travel by air but only between the regional location and Male. The sea travel that has to be made in connection with air travel is more expensive and time consuming. Another debilitating situation is that small transport vehicles available are not buoyant in bad weather conditions, which means that transfer of maternal emergencies during bad weather face additional risks.

3.4 Transport challenges for health workers to reach patients

Health services in the beginning were provided to the atoll population through mobile health teams. Mobile teams from Male, the central level, set out on a journey that lasts 2-3 weeks, reaching out to various parts of the atolls to provide services such as immunization, health screening, and to run occasional health care camps. Later, when community health workers were deployed to the atoll level, their services were also of mobile outreach, reaching out to cover and provide their designated services to the island communities. The community health workers move around the atoll to provide assistance and advice to island level family health care workers and TBAs. These scheduled trips are usually organized monthly and transportation is provided by the atoll offices, and thus are dependent on the limited transportation facility available. For attending an emergency, the patient side usually facilitates the transportation, which is very much reliant on the availability of a boat and community support. This was how it worked in the past. When services improved the outreach service needs changed but did not diminish. With the improvement of services at higher levels, demand for services increased thereby increasing the need for better outreach services. Although atoll level health care facilities were provided with their own transport facilities, lack of maintenance capacity and resources made sustainability of services challenging and difficult.

One of the main responsibilities of the community health worker at the atoll level is supervision of lower level health care. Proper and adequate supervision is hindered by non-availability of feasible transportation.

3.5 Government policies on transport and health

An inter-island maritime transport network has been thought of many times. In the National Development Plan (NDP) 2006-2010 (Ministry of Planning and National Development, 2005), it has been identified that for the holistic development of the nation, an efficient maritime domestic transport network is critical (see Box 1). To facilitate this development, the government focused on and continued its commitment to building harbors and access points in all the islands in the country. Each year, a good amount of government funds is allocated for upgrade and renovation of the harbor. As public sector investment projects, the government invests on harbor development to facilitate transportation access.

Box 1. Transport policies and strategies – National Development Plan 2007-2010

Policy 1: Ensure that the transport system meets the mobility needs of the people

Strategies

- a. Continue access improvement programme for inhabited islands
- b. Facilitate the development of adequate harbors throughout the country
- c. Establish a sustainable harbor maintenance programme
- d. Enable access to finance for private and public enterprises to establish Inter-Atoll and Intra-Atoll Ferry Services
- e. Enable private and public enterprises to invest in public transportation schemes in the Atolls
- f. Enable and provide support to private and public enterprises to develop and operate domestic airports
- g. Ensure the travel needs of local passengers are integrated and catered for in the sea plane operations

One of the major health policy goals is to ensure that all citizens have equitable and equal access to health care. To achieve the goal optimum health care delivery through the 4-tier health

delivery system and make this referral system an effective one is considered important. Given the geographical situation of the country, an efficient transport system is essential to access health care at affordable prices and to promote timely health care seeking behaviors. This need is highlighted in the major health plans. However, the effectiveness of the referral system is challenged by the lack of an appropriate and efficient maritime transport system.

The Health Master Plan 1996-2005 (Ministry of Health, 1995) stipulated that the services of a regional hospital level care have to be accessible within a maximum of two hours of travelling distance. Services at various levels were developed accordingly. However, accessing these services was challenged by the non-availability of a convenient transport system. Developing a transport mechanism for the delivery of health care is not a feasible option. To counteract the challenging situation in transport services, the health sector opted for developing and expanding services in more islands in order to bring the services closer to the people. This way the mobility need of the people for accessing health care is reduced.

4. Lessons and policy recommendations for cross-sectoral collaboration in reducing maternal mortality

4.1 Lessons learned

4.1.1 High cost of health services and diseconomies of scale

The limitation in transport availability has been recognized and dealt with by the government by extending and expanding services to lower levels. The mobile health care approach was considered from the very beginning of health care organization in the atolls. The community health worker placements in the atolls was planned to be connected to transport support and facilitation by the local community and the relevant local administrative authorities. It began as the main reason for inter-island travel by the atoll offices. However, as demands rose and health care services improved, what was then available at the local community and atoll offices did not suffice and the health sector faced the challenge of providing transport for health care delivery in the atolls. In the absence of an organized public transport system and a sustainable mechanism for operating one by the health sector, mobile health services did not succeed. What resulted was the raised cost of health care for both the government and the people. The mobility needs of the people to seek health services were not met. The more feasible and cost effective mobile health care service provision has not materialized.

Under-utilization of services at the peripheral levels overburdened the central level. The absence of an appropriate and convenient transportation network resulted in the inability of the 4-tier health care delivery system to function as planned. As transportation to and from Male is easier, many people bypass the atoll and regional level health services and travel to the central level to seek medical care. This has made the central level health care facility overburdened not only for attending to referrals for tertiary care but also for the provision of basic health care that is skipped in the referral system. This also leaves most of the atoll level health services under-utilized. The lower use of the services leads to skill redundancy of the health care professionals as well as resource wastage and thereby lower economies of scale.

4.1.2 Sustainability of services

The under-utilization of services also poses the problem of retention of health care professionals. Being highly dependent on expatriate health workforce, recruitment and retention will be difficult in case of low professional skill application. This is true for local professionals too. Many local doctors oppose taking up their jobs at a lower level health facility in fear of lower professional application. This situation poses an issue in sustainability of the services.

4.2 Recommendations

4.2.1 Strengthening the outreach maternal health services (mobile clinics)

As a dispersed and scarcely populated island nation, an effective, well organized outreach maternal health services in the form of mobile clinics is seen as a more feasible and sustainable

option. The mobile clinic approach is preferred because it facilitates the service to reach women in risky and immobile conditions. Early screening, early diagnosis and timely action by a mobile service is more appropriate than for women to reach out to the service for timely action. Such a mobile service well connected to a feasible transport network is ideal for a small island nation like the Maldives.

4.2.2 Application and integration of the market forces approach for an effective transport mechanism that facilitates efficient and quality health care

Transport facilities in the Maldives have improved significantly. High speed maritime transport and air travel is established and functioning for its designated purpose. What is lacking is integration with other needs such as health care. Transport service development is however seen in the arena of tourism development which is functioning on the market approach. In a small country like Maldives, diseconomies of scale for running a vertical transport mechanism will be very much minimized if such integration is applied. It will yield dual benefit – an expanded market for local travel as well as reduced cost of health care.

4.3 Conclusions

Being a small island nation of extensively dispersed populations in several tiny islands, an important role of organized and well managed marine transportation is envisaged. In the Maldives, transport services developed with other economic developments – tourism and local trade. Development of aviation services in the country increased the demand for marine transport. Such developments in transportation helped increase the health seeking behavior of the people. However, health care seeking as per the organized referral health care system has not materialized due to the absence of a systemized public transportation system. High cost and difficult maintenance and management of health owned transportation has not proven to be a feasible option for the health care access. These circumstances resulted in continued stress on health care resources. Health sector investments to improve health care services continue, and work is on extending tertiary care to have an aligned transport network in order to benefit the population at large. The burden of escalating health care costs can be reduced if services development considers integration into the available and more feasible transport system.

References

- Maldives Civil Aviation Authority (2014). Maldives Civil Aviation Authority. Available from <http://www.aviainfo.gov.mv/>. Accessed 24 September 2014.
- Maldives Transport and Contracting Company (2014). Maldives Transport and Contracting Company PLC. Available from <http://www.mtcc.com.mv/>. Accessed 24 September 2014.
- Maldivian Aero (2014). Maldivian Aero. Available from <http://www.maldivian.aero/>. Accessed 24 September 2014.
- Ministry of Health and Family and ICF Macro (2010). *Maldives Demographic and Health Survey 2009*. Male.
- Ministry of Health (2013). *Maldives Health Profile 2012*. Male.
- Ministry of Health (2012). *Maldives Health Statistics 2012*. Male.
- Ministry of Health (2003). *Maternal Mortality Synthesis Report*. Male.
- Ministry of Health (1995). *The Health Master Plan 1996-2005*. Male.
- Ministry of Planning and National Development (2008). *Population and Housing Census 2006 - Analytical Report*. Male.

Ministry of Planning and National Development (2005). *Seventh National Development Plan 2006 - 2010*. Male.

Ministry of Transport and Communication (2014). Ministry of Transport and Communication. Available from <http://www.motc.gov.mv/>. Accessed 24 September 2014.

Transport Authority of Maldives (2014). Transport Authority of Maldives. Available from <http://www.transport.gov.mv/>. Accessed 28 September 2014.