TDY Report
Ministry of Health Family Planning

EHEALTH SPOTMAP FIELD TEST

EGAT/I&E/ICT Assessment Team
February 26, 2007 – March 17, 2007

March 27, 2007

Prepared by:
USAID/EGAT/I&E/ICT

VIA CONSULTING GROUP

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1.0 EXECUTIVE SUMMARY:

As one of the recommended QuickStarts from the USAID/Washington Ehealth Telemedicine assessment performed back in November 2006; a team was requested to travel to Madagascar to field test the PDA Ehealth Spotmap solution. The goal was to test the technology in various locations and conditions and develop a regional roll-out plan based on findings and recommendations. From February 26, 2007 through March 15, 2007 a three person team along with representatives from USAID/Madagascar and MOH traveled down the east coast of Madagascar and interviewed mothers throughout the villages to capture their health (pre and post natal) data along with their children health information.

The team identified a set of recommended activities, stated below and condensed in Appendix C, designed to improve the efficiency of the PDA solution and the Ehealth/Telemedicine process. These activities are designed to assist the MOH in capturing "actionable data" that can be used to improve the health and well-being of the Malagasy people. The assessment team determined that both the current political environment and the disposition of the international donor community were supportive of the proposed activities. Most involved demonstrated a sense of urgency to produce demonstrable accomplishments. This is due to the lack of available data and information to make informed patient decisions, particularly in rural areas through-out Madagascar.

The recommendations provided herein will be reviewed by USAID/Madagascar and the MOH. They will then provide USAID/I&E/ICT with a list of activities they would like to undertake. The USAID/I&E/ICT Assessment Team will then develop a Terms of Reference (TOR) and an estimated level of effort (LOE) for each of the undertakings, and will provide this information to USAID/Madagascar for its review and analysis.

2.0 BACKGROUND:

In the last century, three influenza pandemics have swept the globe. In 1918, the first pandemic (sometimes referred to as the "Spanish Flu") killed more than 20 million people worldwide. One-third of the U.S. population was infected, and average life expectancy was reduced by 13 years. Pandemics in 1957 and 1968 killed tens of thousands of Americans and millions across the world. Scientists believe that viruses from birds played a role in each of those outbreaks. Today, the world faces numerous new threats. For example, a new influenza strain — influenza A (H5N1) — is spreading through bird populations across Asia, Africa, and Europe, infecting domesticated birds, including ducks and chickens and long-range migratory birds. The first recorded appearance of H5N1 in humans occurred in Hong Kong in 1997. Since then, the virus has infected more than 200 people in the Eastern Hemisphere, with a mortality rate of over 50 percent.

A country's ability to respond to an outbreak quickly requires a broad surveillance network, coupled with rapid diagnostic and response capabilities. Building this capability in countries at risk will facilitate monitoring of disease spread and rapid response to contain influenza outbreaks and other public health threats. The United States Agency for International Development

(USAID) Bureau for Economic Growth, Agriculture and Trade (EGAT) and the Agency's Global Health Bureau have identified field surveillance of some such threats as a timely opportunity to demonstrate the benefits of Information, Communication and Technology (ICT) for advancing health solutions.

In support of this, USAID's EGAT/I&E/ICT team conducted initial research and development to determine the need for and feasibility of a simple, fast, IT-based field surveillance capability. This initial research concluded that there are a number of Health Management Information Systems that could be utilized for Malaria and Avian Influenza initiative, and that the initiative could be expanded to cover other public health risks. However, there are common challenges among theses solutions such as prohibitive costs and overly-complex business model or technical systems which cannot be easily understood and implemented in the developing country context. As such, the ICT team began the development of a "Spot Map" prototype which can compile and report epidemiological evidence using PDA and/or cell phone based technologies.

The ICT team was interested in field testing the Spot Map's capabilities in a designated country – Madagascar. The technology required some additional functionality and enhancements prior to field testing. Some functionality and requirements were defined under the previous phase of this project and additional requirements were introduced once a country -Madagascar was identified. Requirements for post testing enhancement will be defined based on the field test results and a regional roll-out implementation plan will be proposed. Should it be deemed feasible and beneficial, the implementation plan will be executed which will include enhancements to the technology and the eHealth Solutions Spot Map will be provided in other countries in the Asia Near East (ANE) and Africa (AFR) regions.

3.0 OBJECTIVE:

The purpose of the field test TDY was to observe the functionality of the eHealth Spot Map prototype solution utilizing wireless PDA technology with updating, storing and synchronization capability; and to explore the potential for regional roll-out of the solution; and based on the outcomes of the first two objectives (and should it be deemed feasible and beneficial by USAID), to implement the Ehealth Spot Map technology solution and provide related technical assistance to other countries in the region in need of health risk surveillance.

During this TDY, the team from the USAID Headquarters in Washington DC Office traveled to five different geographic locations with each location having various technological challenges; this allowed the team to observe how the Ehealth Spot Map solution would work in those varying conditions. During their travels, the team performed test in the following order to complete their evaluation of the tool and recommend solutions:

- **GPS Coordination:** The team traveled with three different PDA devices. One having the GPS functionality built within the device and the other two requiring an external GPS device (iTrek). Each device was designed to communicate with a satellite to read longitude and latitude positions. This would assist in identifying the location of the encounter and possible follow-up with patient if deemed necessary.

- **Data Capture:** The PDA application was designed with two navigational paths. One being Outbreak and the other Population Vulnerability. The Outbreak module allowed a Health Agent to quickly plot longitude, latitude and the type of encounter with a specified date and time. The Population Vulnerability module allowed a Health Agent to capture longitude and latitude with a core set of health data related to a mother's and child's health.

- **Data Synchronization:** The PDA application was designed to also allow the Health Agent to transfer the data from the PDA to a remote database. If data service offered by a Telecom company was available the transfer of data to the database will occur by simply pushing the [sync] button. Otherwise the Health Agent identified a geographic location with a computer and internet access available. The PDA would be attached to the computer and through the use of activesync service the data would be transferred to the remote database.

- **Data Visualization:** The application was designed to allow data to display onto a map with limited querying capability. The application would read the longitude and latitude to plot the location of the encounter and display additional information about the outbreak and/or Mother/Child.

In the context of the above, the outcome of this field test provides to USAID/Madagascar and USAID's EGAT/I&E/ICT a Madagascar Post TDY Report, including an initial set of findings and recommendations. USAID/Madagascar and the MOH in Madagascar will analyze these findings and recommendations and identify and prioritize those activities it wishes to undertake. The USAID/ICT/EGAT Field Test Team will then develop a Terms of Reference (TOR) and an estimated level of effort (LOE) for each of the undertakings, and will provide this information to USAID/Madagascar for its review and analysis.

4.0 FINDINGS AND RECOMMENDATIONS:

Based on observing a series interviews conducted by the Health Agents and also having meetings with USAID/Madagascar management and program officers and representatives from the MOH, the TDY Field Test Team was able to determine an initial set of findings regarding the current environment within the Malagasy Ministry of Health, and the broader feasibility of implementing an Ehealth/Telemedicine solution in the operating context of Madagascar. The team then analyzed the findings to develop an appropriate set of recommendations which USAID/Madagascar and the GOM could apply in order to proceed with Ehealth implementation.

Although these recommendations center on the provision of an IT solution(s) to address the Ehealth Telemedicine concerns of MOH and USAID/Madagascar, their scope is broader in nature. The team focused on the PDA Quickstart aspects of the following four areas: GPS Coordination, Data Capturing, Data Synchronization and Data Visualization. This approach reflects the fact that an IT solution in and of itself will not likely solve issues such as child morbidity, poverty and the need for transparency, nor can IT solutions be successfully

implemented in a development context without considering and accounting for the broader paradigm in which they will be implemented and operated. The findings and recommendations are provided below accordingly. Combined, the set of recommendations provides a holistic approach to Ehealth Telemedicine implementation necessary for success within the current context.

4.1 GPS COORDINATION

The team traveled with three different PDA devices. One having the GPS functionality built within the device and the other two requiring an external GPS device (iTrek). Each device was designed to communicate with a satellite to read longitude and latitude positions. This would assist in identifying the location of the encounter and possible follow-up with patient if deemed necessary.

4.1.1 NON-MANDATORY GPS CAPTURING

Finding: The latitude and longitude was designed to be mandatory within the PDA application. If the latitude and longitude coordinates were not able to be retrieved the application would not allow the user to proceed further.

Recommendation: The EGAT/I&E/ICT team recommend that a database be created with basic information concerning the Health Centers; including latitude and longitude. If the GPS is not able to be captured from the unique encounter with patient the application can use the closest Health Center as a default GPS coordinate.

4.1.2 MAPS

Finding: The Maps for portions of Madagascar are not detailed enough to display the individual points for each encounter.

Recommendation: The EGAT/I&E/ICT Team recommend that the MOHFP works with the Geographic Institute and/or PACT to develop the necessary maps to scale down to the necessary level to display encounters at the village, road, or block level.

4.1.3 BI-DIRECTIONAL SYNCHRONIZATION

Finding: The ability to send certain data elements from the village, district, region and national level is very important for decision making and health management of a decentralize country . The reverse is just as important. National information, strategies and decisions must get to the villages in and to the appropriate patients a timely manner when necessary.

Recommendation: The EGAT/I&E/ICT Team recommend that communication and data sharing within the PDA solution is two ways. The path through which data travels to make decisions can be used to disseminate information to individual patient at the fokotany level.

4.1.4 BUILT-IN GPS FUNCTIONALITY

Finding: The team traveled with different types of devices to capture GPS coordinates. Even though the itrek devices were very small; the Health Agents found it very tedious carrying the devices in their pockets for an extended period of time.

Recommendation: The EGAT/I&E/ICT team recommend that the MOHFP utilizes the device that has the GPS functionality built within the PDA.

4.2 DATA CAPTURING

4.2.1 BUSINESS PLAN

Finding: The GOM is committed to the Madagascar Action Plan (MAP). Health is a critical component within the MAP. Developing a Ehealth Telemedcine strategy plan is critical for the success of the project. Some donors expressed interest in the Ehealth Telemedicine initiative but seeking a proposal from the MOHFP.

Recommendation: The EGAT/I&E/ICT Team recommend that a team is established to develop the business plan to present to the World Bank and other donors. It is our estimate that the business plan should take approximately 3 months to develop with a full-time person committed to the developed of the plan with the assistance of members of USAID/Madagascar and the EGAT/I&E/ICT team.

4.2.2 TRAINING

Finding: The MOHFP staff is in need of IT training to incorporate technology, processes, policies, measurements and outcomes to the MAP and it goals and objectives. By using MAP as a framework to develop measurements and outcomes the MOHFP will be able to automate certain processes and track and measure outcomes. Data Warehousing and Business Intelligence is essential in tracking and measuring these outcomes. The MOHFP IT staff is also in need of training in the area of Data Warehousing & Business Intelligence.

Recommendation: The EGAT/I&E/ICT Team recommend that ongoing training be created for the MOH IT staff; particularly in the area of Data Warehousing and Business Intelligence. Also a retention plan must be established to retain the staff members after they have reviewed the necessary training.

4.2.3 SMS TEXT MESSAGING

Finding: Text messaging is offered as a service through several of the Telecom companies in Madagascar. By utilizing SMS Text messaging health information is able to travel quickly to the appropriate individuals and the correct health action is able to occur. It can also be used to inform certain health specialist of a specific need and request assistance.

Recommendation: The EGAT/I&E/ICT Team recommend that communication and data sharing within the PDA solution be performed through the use of SMS Text messaging.

4.2.4 EMR DATABASE

Finding: The PDA solution captures a core set of data elements. Once those data elements are captured the Health specialist within the MOHFP can add additional information to expand the patient record. This will increase the knowledge of the patient and remove the need for total dependency on the paper record log. The record log is the only source of information and is very difficult to tabulate and use to make informed decisions.

Recommendation: The EGAT/I&E/ICT Team recommend that an Electronic Medical Record system be developed or customized and integrated within the PDA Ehealth Spotmap solution. This will allow automated reporting & analysis to occur.

4.2.5 REFERRAL DATABASE

Finding: Due to the limited number of Health specialist; patients must be evacuated to the closest Health Center of Hospital to receive service. Emergency evacuations are very expensive.

Recommendation: The EGAT/I&E/ICT Team recommend that a referral database be integrated into the PDA Ehealth SpotMap solution. With the use of the referral database and SMS Text messaging health specialist can be immediately notified and can establish communication with the individual provide service to the patient in need.

4.2.6 MUTUELLE & EQUITY FUND

Finding: The ability to share risk and receive financial assistance is necessary in Madagascar. Santenet has developed the Mutuelle strategy within Fokotany's. They are currently working on a plan to establish an Equity Fund program that will provide financial assistance for the purchase of prescribed drugs. Also the current software is password protected and does not allow the MOHFP to make any changes. The vendor that developed the software must fly into Madagascar and make the necessary changes.

Recommendation: The EGAT/I&E/ICT team recommend that the PDA Spot Map solution be enhanced to support the Mutuelle. The PDA (cell phone) can also be used within the Mutuelle project to generate additional revenue from those who wish to use the PDA (cell phone) to make phone calls. The EGAT/I&E/ICT team also recommends that the PDA SPotmap solution be usedfor the Equity Fund project; this will allow the users to track the services rendered and the recommended diagnosis; which will allow the MOHFP to track the purchase and distribution of the prescribed drugs.

4.2.7 PDA ENHANCEMENTS

Finding: The Health Agents identified several additional data elements and functionality they would like to see in the PDA Ehealth Spot Map solution.

Recommendation: The EGAT/I&E/ICT team recommend that a requirement document be designed that outlines the total functionality of the solution. The MOHFP will work closely with the team to develop. Once the requirement document is completed the MOHFP IT staff will review and if satisfied will sign off on the requirement document. The EGAT/I&E/ICT team will then make the necessary enhancements based on the approved requirement document.

4.3 DATA SERVICE

Finding: Due to some limitations in the Telecommunications services. The Telecom companies currently only offers voice and SMS Text messaging services. Data Services is not currently being offered. The PDA solution already has the data service functionality built within it; but was not appear to test out the functionality because the service was not available.

Recommendation: The EGAT/I&E/ICT Team recommend that data services be incorporated into the PDA Spotmap solution and that the MOHFP works closely with the MOT and Telecom companies to develop the plan and strategy for its utilization.

4.4 DATA VISUALIZATION & ALERTS

4.4.1 AD HOC REPORTING

Finding: The PDA solution currently has Mapping functionality; as mentioned above detail maps are necessary in order to display the points of each encounter. In addition aggregate data is necessary for reporting and analysis purposes. At each level (district, region, national) different types of reports may be necessary.

Recommendation: The EGAT/I&E/ICT Team recommend that the PDA Ehealth Spotmap solution be enhanced to give the users the ability to generate standard and ad hoc reports for decision making purposes.

4.4.2 ALERTS

Finding: The PDA solution currently captures core datasets that can be used to determine future actions. The ability to utilize the database resources to automatically calculate and alert the Health specialist of the next events is essential; especially due to the limited number of Health resources.

Recommendation: The EGAT/I&E/ICT Team recommend that the PDA Ehealth Spotmap solution be enhanced to automatically calculate certain events (i.e immunization schedule)

5.0 CONCLUSION:

Based on the Field Test TDY to Madagascar February 26-March 15, 2007 conducted by a USAID/I&E/ICT technical team, the context on the ground appears to be appropriate for the implementation of an Ehealth/Telemedicine solution in support of increased transparency as a measure for enhancing the health agenda. Specifically, the IGOH has sufficient political will for such an implementation and have stated their acknowledgment of the existing challenges as well as their commitment to move forward with such an effort. In addition, USAID/Madagascar and a number of other donors are currently engaged in supporting complimentary aspects of the anti-corruption agenda. Successful implementation, however, will require a comprehensive, incremental approach rather than a simple systems software implementation. In the context of Madagascar, the criteria for success of an IFMS extend beyond the domain of IT and infrastructure into aspects of people, processes, infrastructure, policies, and donor coordination. The preceding sections of this document provide a high-level set of findings and recommendations structured around these areas of analysis—people, processes, infrastructure, policy, and donor/private sector coordination. USAID/PMO recommends that USAID/Madagascar pay consideration to the above recommendations and discern which subset thereof they feel best fits into their program. Should USAID/Madagascar wish to proceed with any or all recommendations, USAID/PMO will provide them with more developed and detailed terms of reference, rough order of magnitude cost estimate, proposed schedule, and high-level project/program plan.

APPENDIX A: TEAM MEMBERS AND SCHEDULE

Stephen Settimi (USAID)
Jeff Street (VIA Consulting)
Mike Heinen (VIA Consulting)

Monday February 26, 2007

22h50	Arrive on AF 908 – Transportation to Hotel provided Street

Tuesday February 27, 2007

9h00 – 10h00	Meeting with HPN Office Chief and HPN team Roland & Street
10h30 – 11h30	Meeting with USAID eHealth team to go over the visit schedule Roland & Street
14h30- 15h30	Meeting with MoHFP - DSI team Roland & Street
15h30 – 16h00	Courtesy visit with Acting MDIR and PDA Office Chief Roland & Street

Wednesday February 28, 2007

8h00 – 9h30	Meeting with Director General -ICT at the Ministry of Telecommunications Roland & Street
10h00 – 11h00	Meeting with Pact - Jean Michel Dufils to see synergy with LMI Roland & Street
14h30- 15h30	Meeting with MoHFP - Direction Systeme d'Information (DSI) team Roland & Street

Thursday March 1, 2007

7h00	Depart to Tamatave by road. Roland & Street
12h15	Settimi and Heinen arrive from Jo'Burg
15h00	Stephen Settimi and Mike Heinen departure on MD500 to Tamatave. Arrival in Tamatave at 3:45pm Roland, Settimi, Heinen & Street

16h00	Pick up Stephen and Mike in Tamatave airport, and continue the trip to Foulpointe. Estimated arrival time in Foulpointe is 5:30pm. Stay in Manda Beach Hotel Roland & Street

Friday March 2, 2007

All Day	Field Test All

Saturday March 3, 2007

All Day	Field Test All

Sunday March 4, 2007

All Day	Field Test All

Monday March 5, 2007

All Day	Field Test All

Tuesday March 6, 2007

7h00	Roland, Stephen, Jeff, and Mike leave Tamatave by road to Moramanga
12h00	Roland, Stephen, Jeff, and Mike arrival in Moramanga - Stay in Hotel Diamant
14h00 - 16h00	Field test in clinics in Moramanga All
16h00 - 17h00	Test data update process in LMI ceenter in Moramanga All

Wednesday March 7, 2007

8h30	Roland, Stephen, Jeff, and Mike to leave Moramanga
11h30	Roland, Stephen, Jeff, and Mike to arrive in Antananarivo - Jeff to stay in Colbert hotel
12h00 – 13h30	Lunch with Jean-Michel Dufils, Country Representative of Pact Madagascar Roland & Street
15h00 - 16h30	Jeff to work with GIS Specialists in Pact to look at appropriate GIS maps and test the data synchronization

Thursday March 8, 2007

9h00 – 11h00	Meeting with Stefano Paternostro (Lead Economist) and Dr. Anne-Claire Haye (Health Consultant) at the World Bank Roland, Settimi & Street
14h00 – 16h00	Meeting with Phillipe Lemay (SanteNet Director) and Volcan Cakir (Program Director) in SanteNet Roland, Settimi & Street

Friday March 9, 2007

8h00 – 10h00	Meeting with Wendy Benazerga (HPN office Chief) and Benjamin (CS and FP program manager) in USAID Settimi & Street
10h00 – 11h30	Presentation of findings of the field test to USAID staff Settimi & Street
14h30 – 15h00	Courtesy visit to the vice-Minister of Health and Family Planning Roland, Settimi & Street
15h00 – 16h30	Presentation of findings to the members of 'Comité de Développement de la Telemedecine' of MoH. Settimi & Street

Saturday March 10, 2007

12h00	Pick up Stephen Settimi from Colbert hotel to airport - Transportation and expeditor services provided.
All Day	Off

Sunday March 11, 2007

All Day	Off

Monday March 12, 2007

9h00 - 10h30	Field test in clinics in Antananarivo Street
10h30 - 11h30	Study sample database in Main hospital in Antananarivo Street
12h00 - 13h30	Lunch with the President of MUSBC

	Street
15h00 - 15h30	Meting with Francisco Bassili in UNICEF Street
16h00 – 17h00	Meeting with Volcan Cakir in SanteNet Street

Tuesday March 13, 2007

9h00 - 11h30	Meeting with Antoine Talarmin, Institut Pasteur Street
14h00 - 16h00	Meeting with Gilles de Villenaut (Chief Technical Officer) in TELMA Street

Wednesday March 14, 2007

9h00 - 11h30	Go to FTM (National Geographic Institute) to check maps Street
11h30 - 14h30	Meet with Santenet Street
22h00	Pick up Jeff Street from Colbert hotel to airport. Transportation to airport provided.

APPENDIX B: GLOSSARY OF TERMS

EASSy – Eastern Africa Submarine Cable System
CHD1 – Centre Hospitalier de District du niveau 1 (Level 1 District Hospital Center)
CHD2 – Centre Hospitalier de District du niveau 2 (Level 2 District Hospital Center)
CHRP – CHRR (Centres Hospitaliers Régionaux de Référence)
CHU – Centre Hospitalier Universitaire (University Hospital Center)
CSB1 – Centre de Santé de Base du niveau 1 (Level 1 Basic Health Center)
CSB2 – Centre de Santé de Base du niveau 2 (Level 2 Basic Health Center)
ICT – Information Communication Technology
MAP – Madagascar Action Plan
MOE – Ministry of Education
MOHFP – Ministry of Health and Family Planning
MOTP – Ministry of Telecommunication and Post
PRSP – Poverty Reduction Strategy Paper
SMS – Simple Messaging Services (text messaging)
SWAp – Sector Wide Approach to Planning
VSAT – Virtual Small Aperture Terminal
PDA –
SMS –

APPENDIX C: RECOMMANDATIONS TABLE

	Recommendation	Level of Effort
4.1 GPS Coordination		
4.1.1 Non-Mandatory GPS Capturing	The EGAT/I&E/ICT team recommend that a database be created with basic information concerning the Health Centers; including latitude and longitude. If the GPS is not able to be captured from the unique encounter with patient the application can use the closest Health Center as a default GPS coordinate.	
4.1.2 Maps	The EGAT/I&E/ICT Team recommend that the MOHFP works with the Geographic Institute and/or PACT to develop the necessary maps to scale down to the necessary level to display encounters at the village, road, or block level.	
4.1.3 Bi-Directional Synchronization	The EGAT/I&E/ICT Team recommend that communication and data sharing within the PDA solution is two ways. The path through which data travels to make decisions can be used to disseminate information to individual patient at the fokotany level.	
4.1.4 Built-In GPS Functionality	The EGAT/I&E/ICT team recommend that the MOHFP utilizes the device that has the GPS functionality built within the PDA.	
4.2 Data Capturing:		
4.2.1 Business Plan	The EGAT/I&E/ICT Team recommend that a team is established to develop the business plan to present to the World Bank and other donors. It is our estimate that the business plan should take approximately 3 months to develop with a full-time person committed to the developed of the plan with the assistance of members of USAID/Madagascar and the EGAT/I&E/ICT team.	
4.2.2 Training	The EGAT/I&E/ICT Team recommend that ongoing training be created for the MOH IT staff; particularly in the area of Data Warehousing and Business Intelligence. Also a retention plan must be established to retain the staff members after they have reviewed the necessary training.	

	Recommendation	Level of Effort
4.2.3 SMS Text Messaging	The EGAT/I&E/ICT Team recommend that communication and data sharing within the PDA solution be performed through the use of SMS Text messaging.	
4.2.4 EMR Database	The EGAT/I&E/ICT Team recommend that an Electronic Medical Record system be developed or customized and integrated within the PDA Ehealth Spotmap solution. This will allow automated reporting & analysis to occur.	
4.2.5 Referral Database	The EGAT/I&E/ICT Team recommend that a referral database be integrated into the PDA Ehealth SpotMap solution. With the use of the referral database and SMS Text messaging health specialist can be immediately notified and can establish communication with the individual provide service to the patient in need.	
4.2.6 Mutuelle & Equity Fund	The EGAT/I&E/ICT team recommend that the PDA Spot Map solution be enhanced to support the Mutuelle. The PDA (cell phone) can also be used within the Mutuelle project to generate additional revenue from those who wish to use the PDA (cell phone) to make phone calls. The EGAT/I&E/ICT team also recommends that the PDA SPotmap solution be usedfor the Equity Fund project; this will allow the users to track the services rendered and the recommended diagnosis; which will allow the MOHFP to track the purchase and distribution of the prescribed drugs.	
Data Services:		
4.3.1 Data Services	The EGAT/I&E/ICT Team recommend that data services be incorporated into the PDA Spotmap solution and that the MOHFP works closely with the MOT and Telecom companies to develop the plan and strategy for its utilization.	
Data Visualization & Alerts:		
4.4.1 Ad Hoc Reporting	The EGAT/I&E/ICT Team recommend that the PDA Ehealth Spotmap solution be enhanced to give the users the ability to generate standard and ad hoc reports for decision making purposes.	
4.4.2 Alerts	The EGAT/I&E/ICT Team recommend that the PDA Ehealth Spotmap solution be enhanced to automatically calculate certain events (i.e immunization schedule).	

The following provides a generalized description of the varying levels of effort:

- **Low:** Relatively easy to implement in the short term; require a low level of effort; have little or no dependency on other recommendations
- **Medium:** Relatively more complex to begin implementation in the short term; require a medium-term timeframe in which to complete; may require the completion of precedent recommendations/tasks; tend to require more than one interrelated set of activities or tasks
- **High:** Most complex to implement; require a long term approach, commitment and timeframe to complete; may require the completion of precedent recommendations/tasks; requires several interrelated sets of activities or tasks.