BULLETIN

Ministry of Health, Department of Planning and Health Information
University Research Co, LLC.

USAID ជំនួយពីពលរដ្ឋអាមេរិក

URC Cambodia

April 2011 Insert No 4

Cambodian Web-Based Heath Information System (HIS)

LEADING IN HEALTH INFORMATION FOR BETTER HEALTH SERVICES

1. Cambodian HIS Web-Based Database Evolution

Good health statistics are a critical resource for evidence-based decision making, better planning, monitoring and evaluation.

Since the reform of the health system in 1995, the Ministry of Health (MoH) has emphasized that the health information system (HIS) is a powerful tool for national, provincial, and district managers to set priorities and allocate resources. Therefore, increased and regular investment in the health information system is a critical need for a country like Cambodia, with a growing demand for quality health information.

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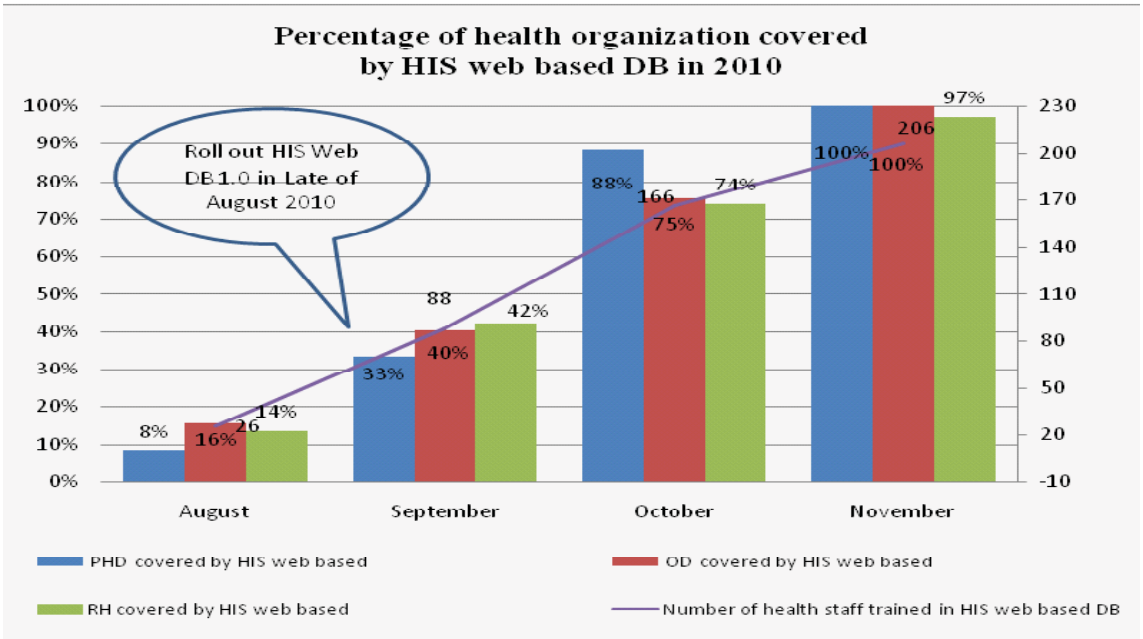
គេហទំព័រនៃប្រព័ន្ធព័ត៌មានសុខាភិបាលកម្ពុជា
http://www.hiscambodia.org

The MoHDepartment of Planning and Health Information (DPHI), with funding from the United States Agency for International Development(USAID)and delivered by URCBetter Health Services (URC-BHS), has developed a new HIS web-based system, using the same data points as the previous Microsoft Access HIS database (upgraded in 2009 that was then supported by Health Sector Support Project Phase II(HSP2)).

In March 2010, URC-BHS, funded by USAID, in collaboration withMoH DPHI upgradedthe HIS database into a HIS web-based database system.

Features of the HIS are as follows:

- Accuracy and safety
- Core indicator tracking
- Timely data collection
- Timely reports



Technical teams of DPHI and URC reviewed technical needs and key features for upgrading the HIS Access dabatabse to the HIS web-based database. DPHI, with financial and technical support from URC-BHS,held three consultative workshops with the participants of national, provincial, operational district, hospital and health development partner staff. The workshops were successfully concluded with fruitful results and agreement. According to the results and consensus made during several workshops, both technical teams of DPHI and URCreviewed and revised the user interface of the Cambodian HIS web-based database. The HIS Web-based Database was introduced to field level in Auguest 2010 after providing six training courses for all HIS governmental officers in Cambodia.

Trainings:

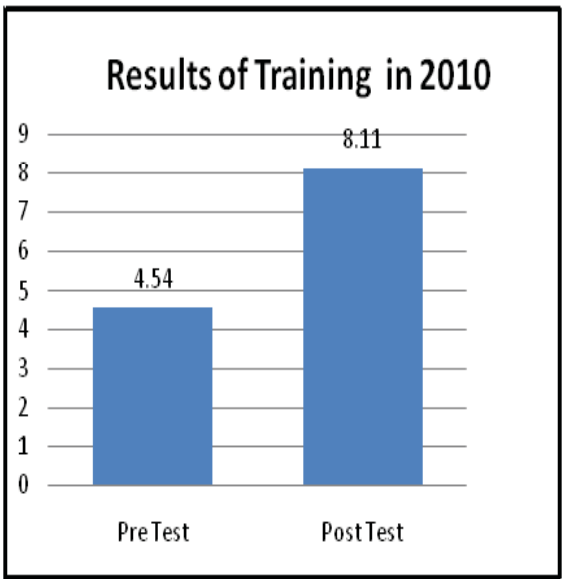
Duringthe three-month period from August to November 2010, the MoHDPHI, with financial and technical support from URC, conducted six

Training in 'Cambodian Web-based HIS' Conducted in Kampong Cham Province



HIS web-based courses, training a total of 206 participants coming from 24 provinces, national hospitals and health development partners. The trainings were smooth and successful with the following results:

- Pre-test average score: 4.54
- Post-test average score: 8.11



Utilization:

The Cambodian Web-based HIS was developed with useful features and functions for users at all levels of the health systemsuch as data entry, edit, report and analysis, with all features enabled in Khmer and English.The system has more functions and features that will be describe in following sections. In addition, the system covers HIS data from the last 5 years (2006-2011).

HIS Web-based Database has the following features:

Data View:

- Population statistics disaggregated by provinces, operational districts and health facilities
- Health facilities for public, NGO and private providers
- Reports of health centers (HC1), and hospitals (HO2)

- **Data Entry:**

- Add population data
- Add new health facilities, both public, NGO and private providers
- Add HIS data through HC1, HO2, and other forms (NGO and private providers)

Data Edit:

- Edit Population data
- Edit new health facilities, both public, NGO and private providers

Edit HIS data through HC1, HO2, and other forms (NGO and private providers)

HIS Data Inventory Report:

Report of number of facilities reported against total facilities

HIS Monthly Report:

Produce HIS monthly report format,such as HC1HO2 and others

Core Health Indicators:

Produce core health indicators that meet the requirements of MoH as HSP2 indicators

Local User Mode:

- Provide ability to use HIS web-based database in offline and online modes
- Provide features to upload data and information into the system

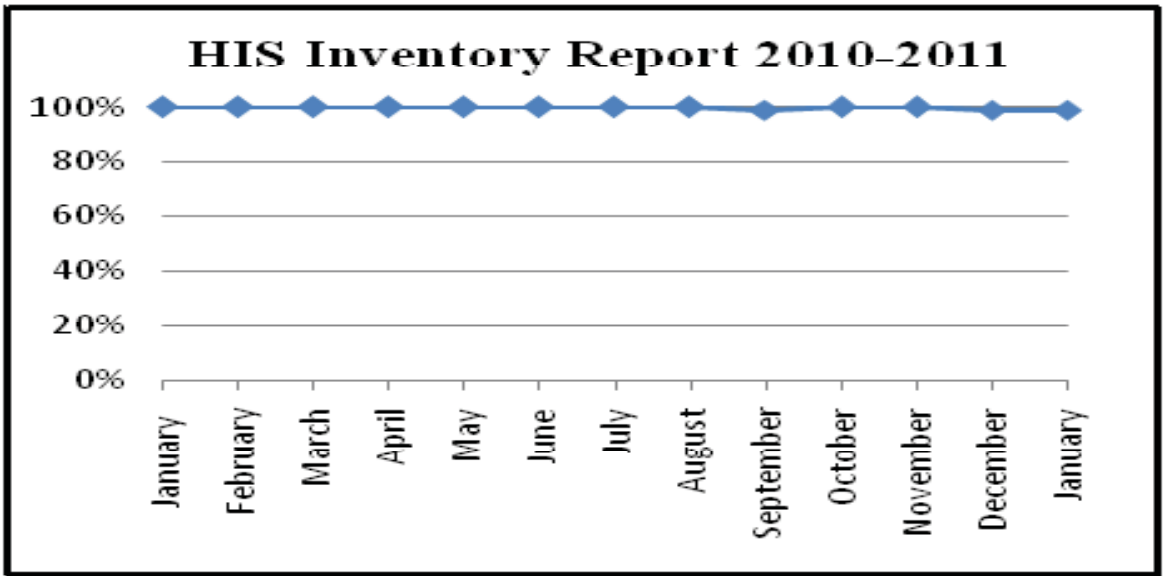
Users Administrative:

- DPHI has managed user permission. Users have different permission in managing HIS data and reports

2, Timely HIS Data and Reporting:

Cambodian HIS web-based database was developed to meet the demand of users at all MoH levels and provide easy feasibility forhealth managers to retain and manage health data. Furthermore, the HIS databaseprovides accurate and on time Health information. Cambodia HIS web-based database is a system that provide useful features to all users in data entry, edit and report. Currently, the HIS web-based database manages health data collected country-wide, including 989 health centers, 55 referral hospitals, 24 provincial hospitals,and 10 national hospitals, allowing for up to 100% of number of facilities reported against total facilitiesat the end of 2010 and early 2011.

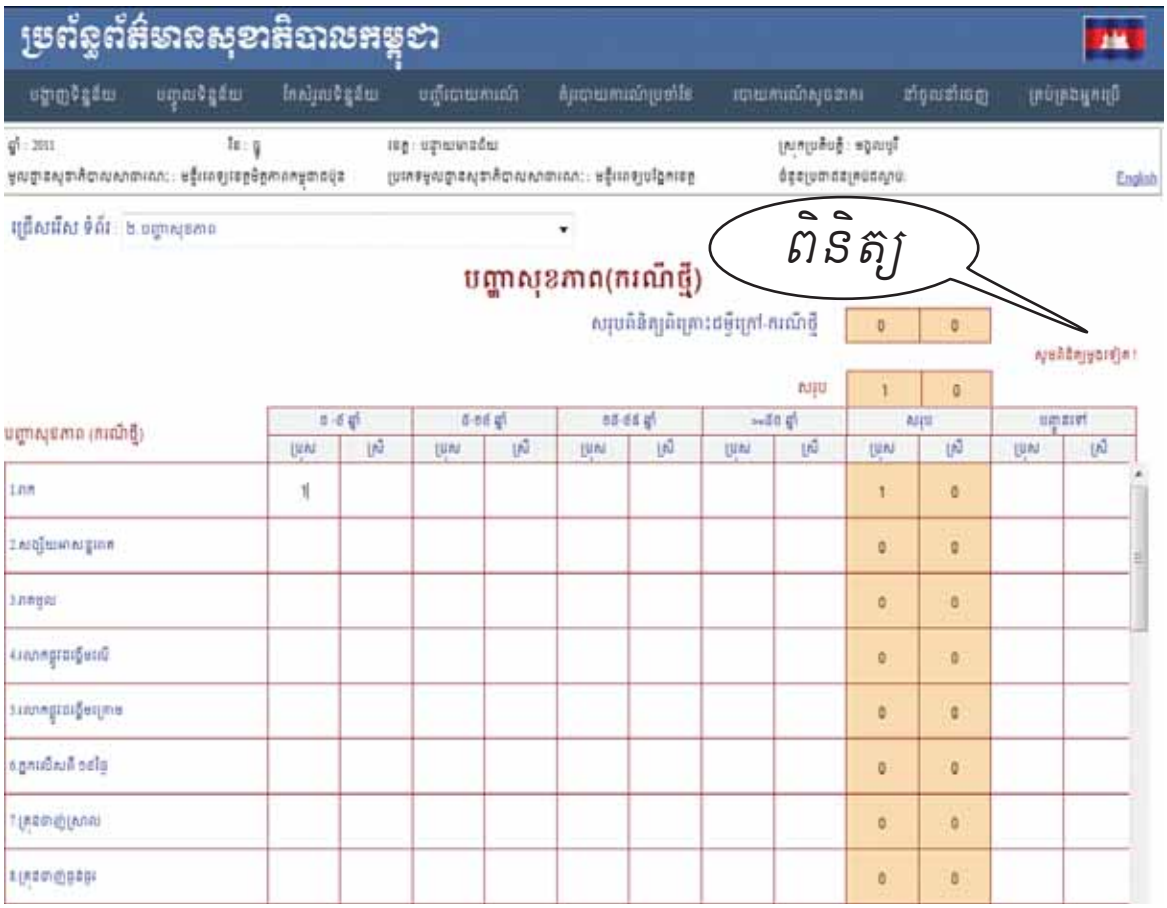
Figure 5: HIS Inventory Report 2010-2011
The graphic indicates an improvement of completeness and on time reportof HIS data transmission at all levels



3. Data Quality Control:

The quality and accuracy of data are critical mattersfor health information systems. Cambodian HIS web-based database haskeyfuncions and features to control and check data quality during the data entry sessions. Alert messages will appear in red when users enter data incorrectly(Please check again!will pop up). The users then need to correct the data at that time.

Figure 6: Cambodian HIS



Below are the functions of data quality control:

1. Double-checking figures against statistics: This function is created to prevent wrong figure input.

• Example 1: The above picture is double-checking data of new outpatient consultation (OPD) numbers that appeared in two places: first is a total number cell and second in table of OPD, both are same number/figure.

• Example 2: Like page 8 of HC1 monthly report, the system will not allow users to enter maternal death number that is more than the total delivery number in the same month.

The double-checking function is prepared for checking data quality during entering HC1 and HO2 data.

1. Digit Control: HIS web-based database identifies and limits the digits of data that are enteredinto the cell to prevent any typing errors. The users are not able to enter too many digits in certain cells (for exemple, death data entry cell). For instance, mortality rate by age for each month must be less than 3 digits.

2. Edit data: The system allows the data entry person who has permission to edit health information. Other users are not allowed to editraw data. To facilitate fast reporting and to avoid tardiness, the system is programmed to

Figure 7: Cambodian HIS



set the deadline for data entry by day 20 of each month. If any health facility is tardy, a contact with the MoH's expert officials needs to be made in order to request for data entry.

4. Reporting Features

Figure 8: Cambodian HIS

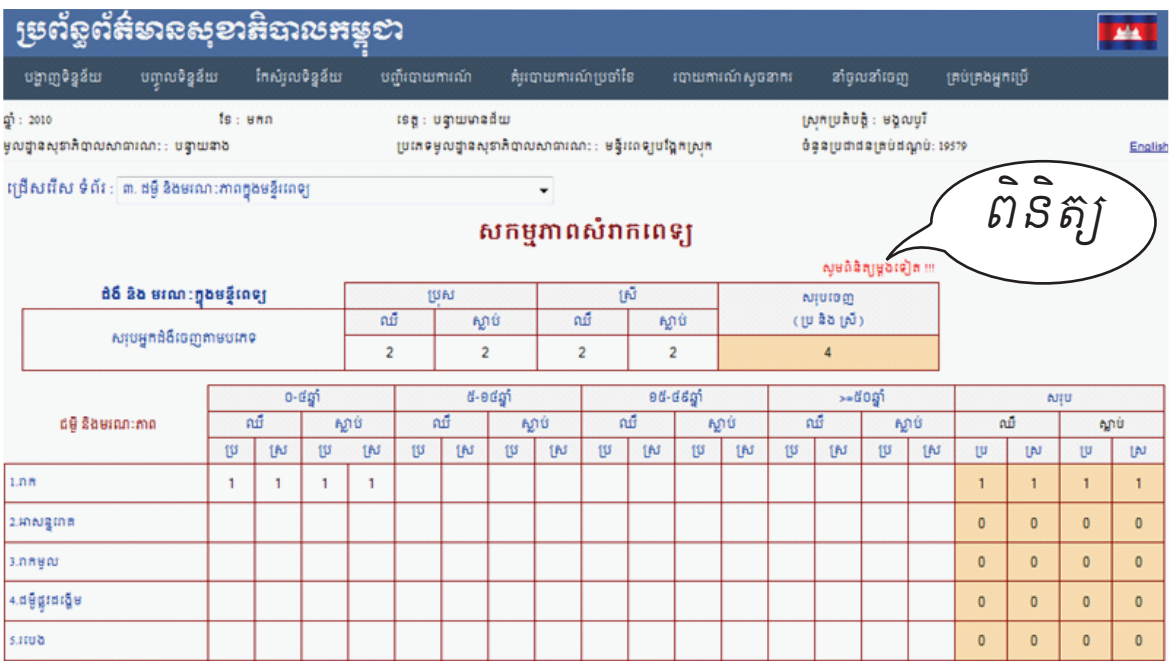


Table of Data Quality Control

Data Quality Checking Points	Data Quality Check Features
Number of facilities reported against total facilities	Confirm by HIS inventory report by time and sites
Double entry for same facilility and same month	Does not allow for same name and same month for data entry.
Data seems not true	Does not allow delivery data in age under 5 years. Does not allow GYN data in male data entry cells.
Typing Errors	Does not allow to enter text and letter in data entry cells.
Digit Control	The allowable digit for data entry such as death cannot be more than 3 digits in a cell for a month in an age column.
Cross Check statistic (OPD)	The number of outpatient consultations must be equal to the 'total' value and details need reporting. The total numbers on page 1 and page 2 must be equal.
Cross Check statistic (IPD)	The total number of inpatients on page 3 and page 4 must be equal.
Cross Check statistic (ANC)	The total number of inpatients on page 3 and page 4 must be equal.
Cross Check statistic (Delivery)	The number of pregnant women who take an HIV test must be smaller than or equal to the number of women receiving ANC visits. The pregnant women who have positive results must be smaller than the number of pregnant women who have taken an HIV test.
Cross Check statistic (HIV Tests)	The number of complicated deliveries must be smaller than that of total deliveries.The number of deliveries receiving ARV must be smaller than or equal to that of total deliveries.
Cross Check statistic (Induced and spontaneous abortion)	Total positive results of HIV test must be less than the number of people who have taken HIV tests. The number of referred induced and spontaneous abortion must be smaller than that of total induced and spontaneous abortion.

Nowusers are able to generate at least four kinds of health report forms:

Monthly Report Form for Health Centers - HC1

HC1 is a report format for health centers. Users can generate monthly, quarterly and annual reports. With those reports, users are able to do data analysis to see the progress and weakness of their programs.

HC1 contains 12-pages of health information about health services and diseases such as outpatient consultations, inpatients for health centers which are former provincial district hospitals, laboratories, malaria, antenatal care, delivery, postpartum care, folic acid and iron supplementation,induced and spontaneous abortion, birth, birth spacing, deworming mebendazole, Vitamin A, expanded program on immunization, tuberculosis, leprosy, dental, ART and breast self-examination.

Figure 9: Report Sample for Health Centers

Monthly Report Formfor Hospitals - HO2

HO2 is a report format for hospitals. Users can generate monthly, quaterly and annual reports. With those reports, users can do data analysis to identify strengths and weaknesses and develop a timely and proper resolution plan.

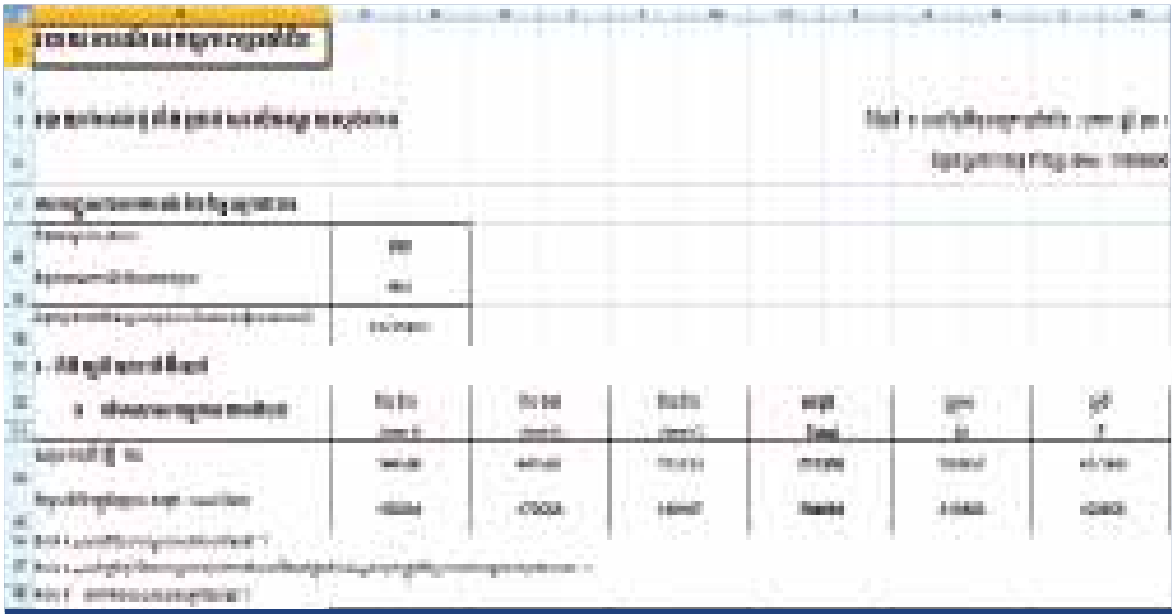


Figure 9: Report Sample for Health Centers

HO2 contains 15-pages of information about health services, diseases and death cases. HO2 provides more information than that given by health centers, including inpatient service, surgery service, X-ray, echography, scanner, mammography, fibroscopy, endoscopy, ECG, echo-cardio, echo-dopler, cobalt-therapy as well as kinetic-therapy. Notably, the reports can be retrieved in Microsoft Excel format.Figure 10: Report Sample for Child Delivery by Month

Indicator report

HIS web-based database contains indicator reports that users can generate in a timely manner, which enable them to produce progress reports and formulate future plans.



Figure 10: Report Sample for Child Delivery by Month

HIS web-based database contains core indicators necessary for all health programs.

Figure 11: Cambodian HIS Core indicator report



5. User Feedback:

Forty govermental HIS officers were interviewed about their opinion related to using the HIS web-based database.

The above graph indicates that 97.5% of users said that HIS web-based database is easy to use.

The graph below indicates that:

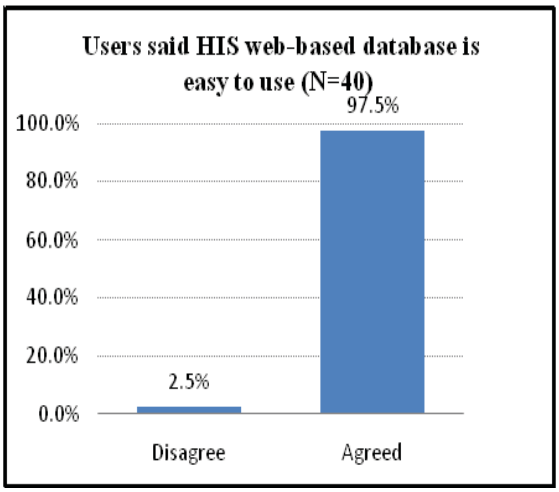
1. 97.5% of users said HIS web-based database is easy to use

2. 97.5% of users are very satisfied with the system

3. 92.5% of users said it is important for their organization

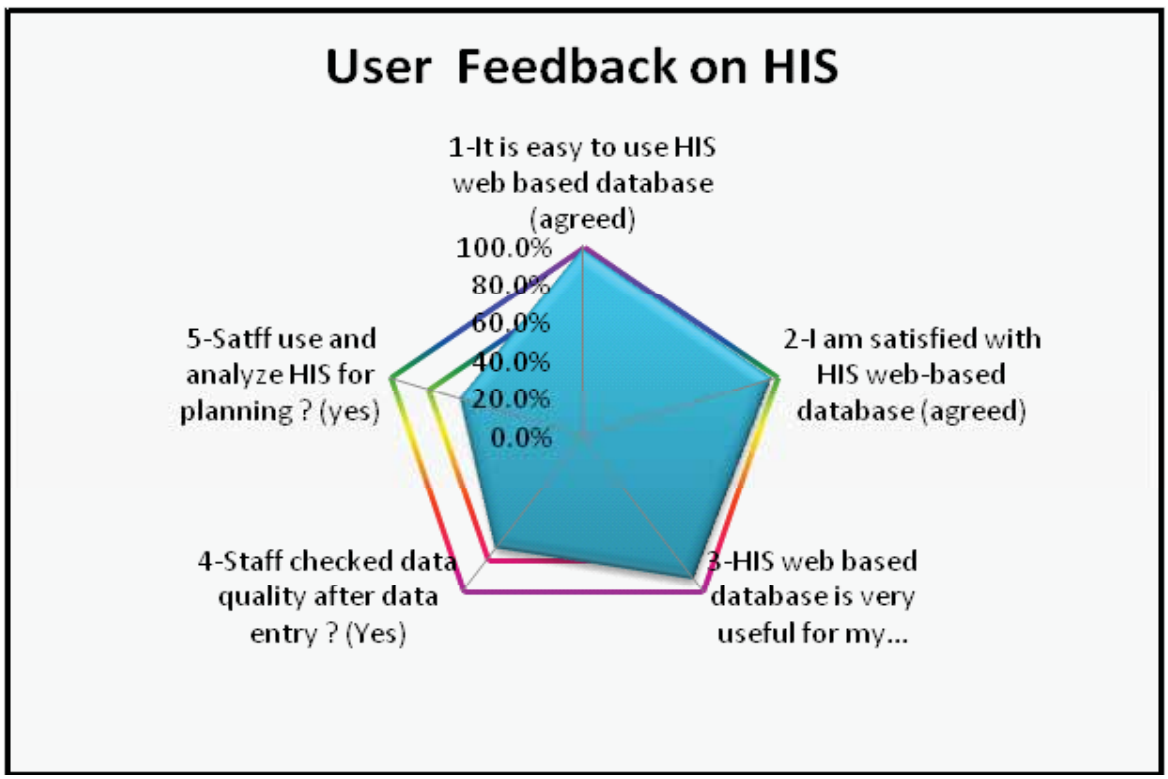
4. 72.5% of users often check and edit data through the system

Figure 12: Page for Core Indicator Report Sample



5. 63.0% of users said they analyse and use data through the system

Figure 13: Users' Viewpoints on the Cambodian Web-based HIS



6. Conclusions:

Cambodian HIS web-based database has been fully implemented country-wide, on time and smoothly. The users just entered data into the system and then data will appear anywhere and anytime for all users without any required data transmission through sending emailsor transferring files on USB as done so far. Moreover, the system is verysatisfactory.

Nevertheless, there are still many other things to consider and features to add in HIS web-based database. Those include data quality improvement and data analysis and usage at all levels of the Cambodian health system.

The article is made byDPHI of the Ministry of Health and URC

This article is to present new technology in managing the health information system through web-based applications and contribute to more effective use, better decisions, and better services.



នាយកដ្ឋានផែនការ និងព័ត៌មានសុខាភិបាល
ការិយាល័យប្រព័ន្ធព័ត៌មាន





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