Timely Hospital Surveillance: From Paper-based Data Collection to Netbooks in KEMRI/CDC HDSS

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1. KEMRI/CDC Research & Public Health Collaboration

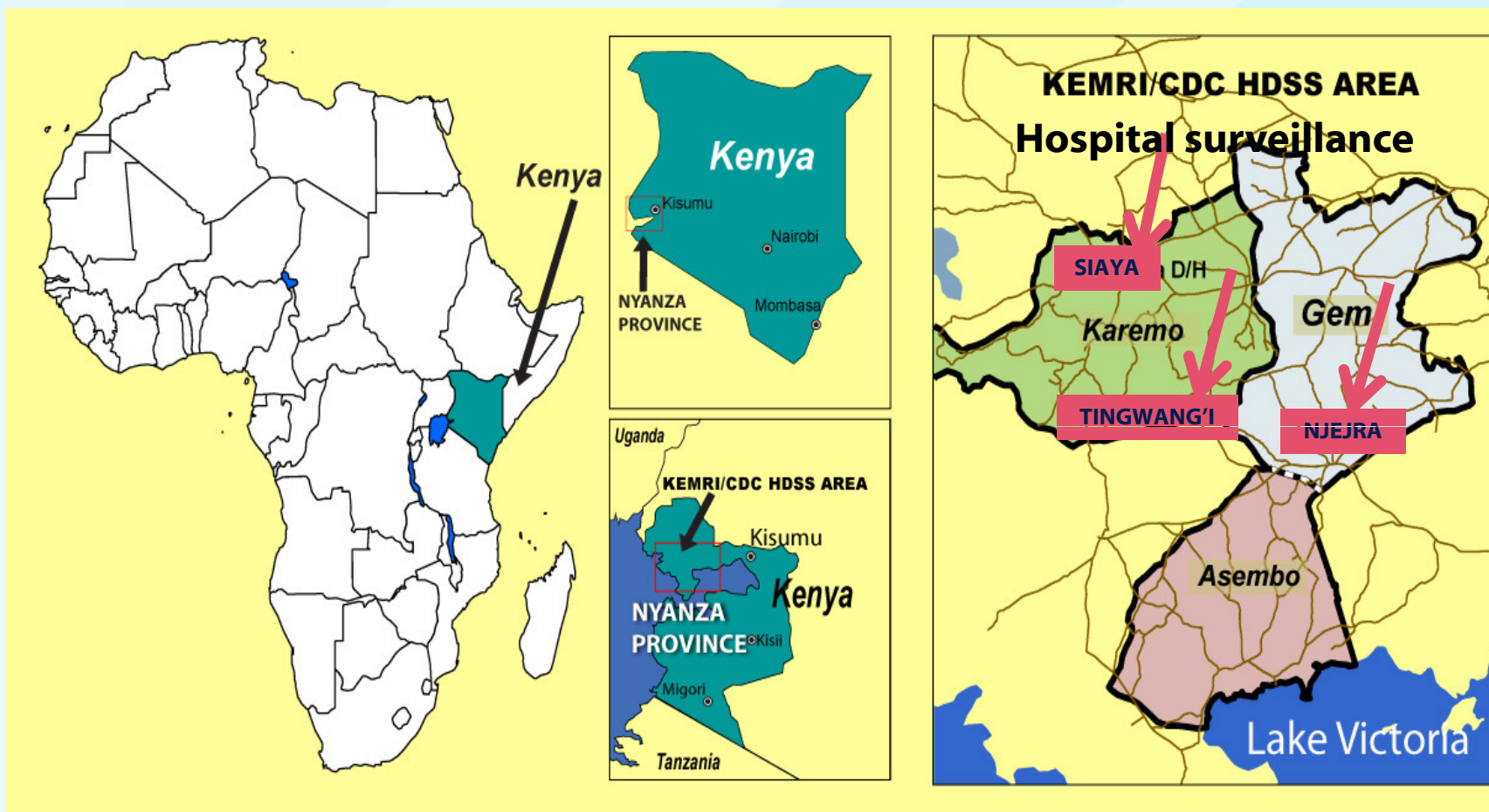**11th INDEPTH Scientific Conference (ISC)**

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Maputo- Mozambique

KEMRI/CDC HDSS Surveillance Area

Approximate area: 700 km^2
Approximate population: 223,000
Households: 92,187

Background

❑ KEMRI/CDC Research and Public Health Collaboration has been implementing paper-based data collection of hospital information in the HDSS since 2001 to 2010

❑ Challenges faced were:

- High costs of printing questionnaires
- Tedious tracking of questionnaires
- Scanning errors
- Long time taken for the collected data to be ready for use

Previous Hospital Surveillance System
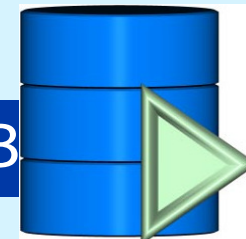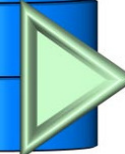
Data collection forms
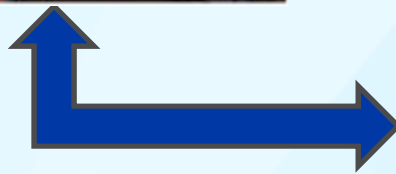
Scanner

Transitional data

1. Data validation
2. Data cleaning
3. Data transfer

Foxpro DB

Staff Preparing the Questionnaires at the Data Center

Data Clerks Scanning the Questionnaires at the Data Center

Background

❑ Another challenge was linking hospital information with the HDSS household information due to:

- ▪ Inability to integrate the search engine with the data collection tool which was paper-based
- ▪ Time taken to manually search for permanent Identification numbers in the data center

Objectives

❑ To reduce the time between data collection at the health facility to processing and management of the data at the data centre

❑ To evaluate if computerized data collection could:

    ❑ Improve data linkages to HDSS household data

    ❑ Reduce the cost of data collection

Methodology

- Developed an application for data collection using Visual Studio.NET and a Microsoft SQL server database

- Converted the existing scannable forms into electronic forms

- Included some of the validations previously used for cleaning the data like:-

    - Missing value checks

    - Invalid value checks

    - Skip patterns

- Integrated the HDSS household database and search engine with the application to facilitate linkages

Methodology

- ❑ Trained the health facility staff
- ❑ Deployed the application into netbooks
- ❑ Evaluated the application with 2,748 records collected from November 1st 2010 to February 28th 2011

Current Netbook System

Data collection → Download to external disk → Upload data → Temporary database → 1.Data validation 2.Data cleaning → Main database
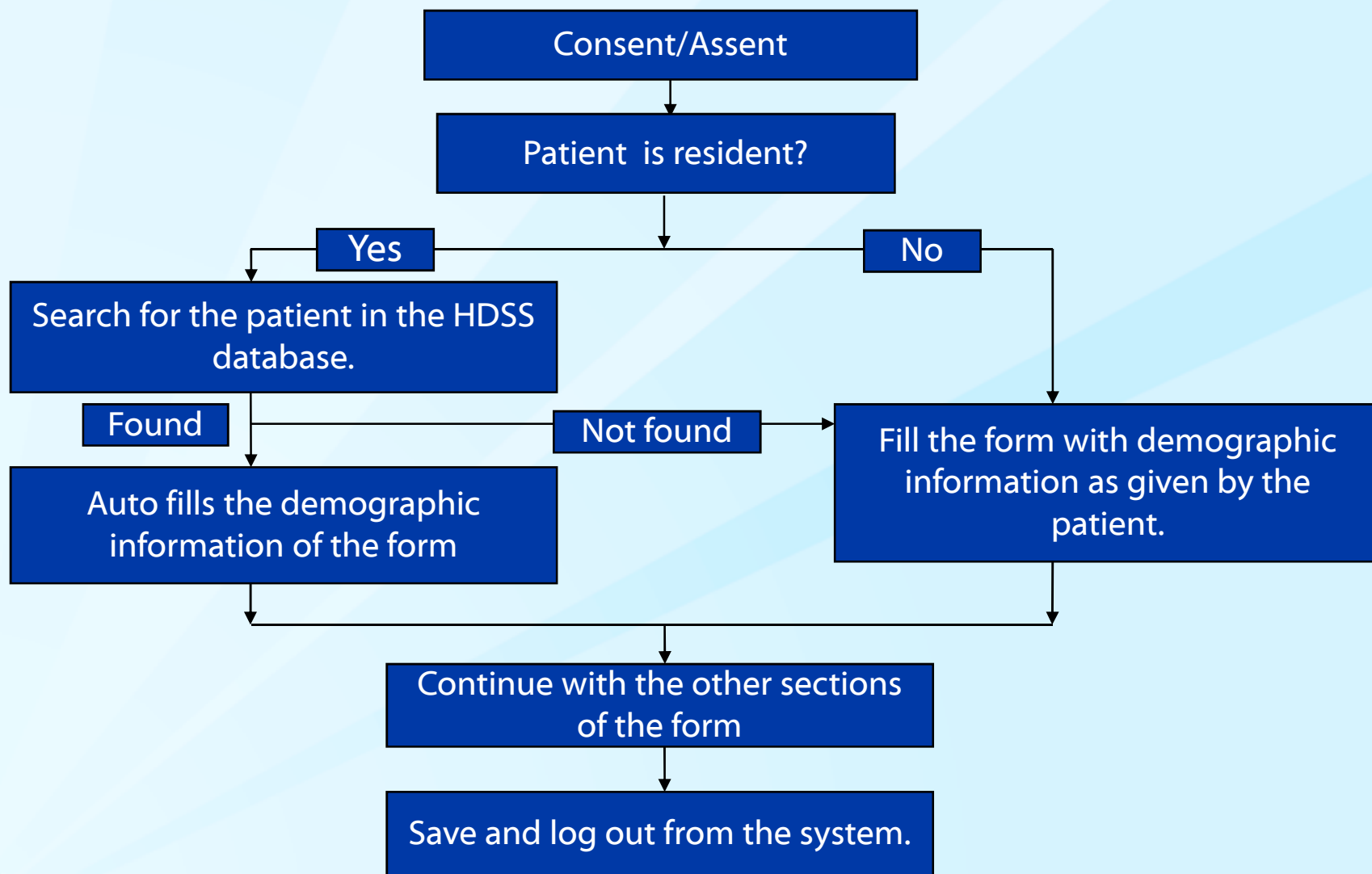
Training of the Health Facility Recorders

Health Facility Recorders Collecting Data using a Netbook

How to Use the Integrated Search Engine

Consent/Assent

Patient is resident?

Yes

No

Search for the patient in the HDSS database.

Found

Not found

Fill the form with demographic information as given by the patient.

Auto fills the demographic information of the form

Continue with the other sections of the form

Save and log out from the system.

Results

	Paper-based data collection	Electronic data collection	Savings
Data ready for use	20 days	5 days	15 days
Cleaning of data	1920 person time	640 person time	1152 person time
Paper used	62,760 papers	500 papers	62,260 papers
Search and linkage to HDSS data	52%	69%	17%

Comparison of Capital Investment Approximation

Paper-based

- [ ] Bulk Printer – $4625.0
- [ ] Toner - $1400.0
- [ ] Scanner and teleform software - $6590.0
- [ ] Storage space for the questionnaires

Electronic-based

- [ ] Netbooks - $4375.0
- [ ] External disk - $87.5
- [ ] Software development costs - $12000

Challenges

- Training of heath facility staff
- Initial costs of netbook computers was high
- Software development costs were high and considerable time taken to develop the application for data collection

Conclusion and Recommendations

- ❑ We are able to produce weekly reports within the week as compare to paper-based method we had monthly reports
- ❑ Data collection method expedited data processing and readiness
- ❑ Improved linkage to HDSS household data
- ❑ Distributed Local Area Network (LAN) in the health facilities to increase the speed of data search and processing
- ❑ Currently we have Integrated fingerprinting as a method of patient identification and linking to HDSS household data

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- INDEPTH Network

Thank you

For more information please contact:

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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