HCT2

KAR Programme on Disability and Healthcare Technology

DFID Department for International Development

Health information systems, processes and technologies

LOCATION
Central Hospital, Lilongwe, Malawi

PARTNER
BAOBAB HEALTH PARTNERSHIP INC, USA
Baobab Health Partnership Inc was created to improve the provision of healthcare and healthcare systems in developing countries by implementing appropriate information technology and data management systems.

SUMMARY
The project was designed to develop, implement and evaluate a new data-collecting and management system for Lilongwe Hospital in Malawi. The system comprises clinical workstations that use simple, touch-screen technology which are connected to a central server through wireless networks.

PERIOD OF FUNDING
January to May 2001

GRANT
£19,250

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BACKGROUND

Malawi is one of the world's poorest countries. In 1998, the **United Nations Development Programme** report stated that 48% of the population could not afford to meet their basic needs, while **World Health Organization** data for 1999 showed that one out of every four Malawian children died before reaching five years of age.

Healthcare in Malawi is hampered by a shortage of medical staff, drugs and diagnostic resources. Addressing these problems is made particularly difficult by the absence of reliable data on which to base any plan for improvement.

Data is unreliable for many reasons:

- pre-printed forms on which medical records are written frequently run out and so no records are kept
- doctors, seeing up to 80 patients per day do not have the time to fill out the records fully (the ratio of patients to doctors in Malawi is 25,000:1)
- clerks who transcribe details from the written to computer records often make mistakes because they have no medical training.

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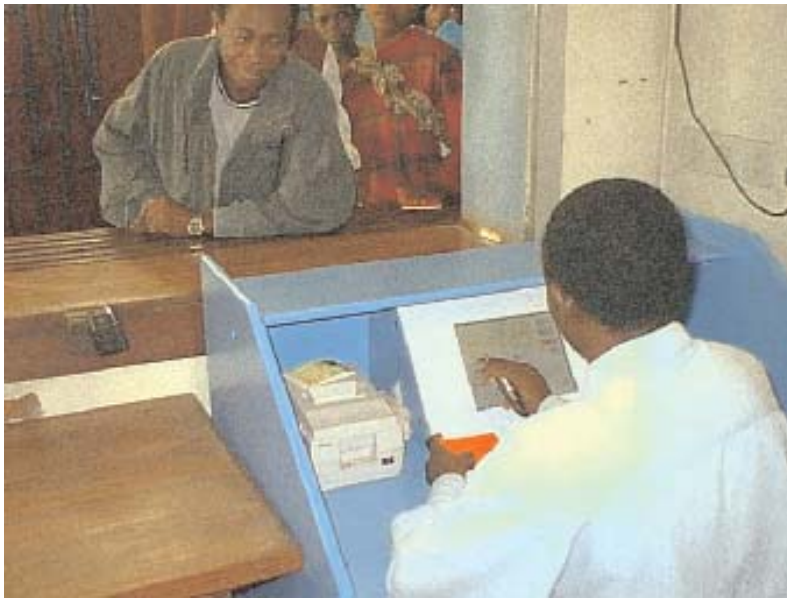
Baobab Health Partnership



THE PROJECT

In response to this situation, the **Baobab Health Partnership** developed and implemented a computer-based health information system for **Lilongwe's Central Hospital** that:

The system has a checklist that prompts relatively inexperienced clinicians to consider key pieces of clinical information when assessing the patient.

- helps clinicians with direct healthcare delivery:
  - The system improves the accuracy of diagnoses by providing a readily accessible, computerised medical history of the patient. It reduces time spent providing patients with a handwritten summary of their encounter with the doctor (under the new system each summary can be printed directly from the touch-screen). In addition, using the computerised system reduces time spent by nurses registering patients when they arrive at the hospital.
- collects complete, accurate and timely information and makes it available to support decision-making at all levels:
  - The system has a checklist that prompts relatively inexperienced clinicians to consider key pieces of clinical information when assessing the patient. This information relates to both the patient's current condition and their medical history, making diagnosis more accurate.
  - The system also enables nurses to record patient information as a computerised record, via the touch-screen, while the patient is present. This eliminates the risk of errors when transferring handwritten records to computer at a later date – sometimes weeks after the record was first made, and when the patient has been discharged.

The workstations are designed for use in the workplace, taking into account existing procedures so as to minimise disruption.

The system works via several workstations, each comprising a computer, a small printer and a power supply, all built into a movable desk. The computer uses a touch-screen instead of a mouse and keyboard, so that people with no previous experience of computers can quickly learn to use the system. A car battery powers the computer and printer, so the system can continue to function during power cuts. Workstations use wireless networking technology linked to a centralised computer where all data is stored.

The workstations are designed for use in the workplace, taking into account existing procedures so as to minimise disruption. At the Central Hospital, eight workstations are being used in inpatient registration, the outpatient clinic and inpatient services.

Since the beginning of the pilot project, information about 26,500 patients has been registered – 22,000 outpatients and 4,500 inpatients. Information collected during outpatient visits and inpatient stays helps clinicians by making the medical history of returning patients available at the time they are being seen. The system has also improved access to patients' paper-based medical records by cross-referencing patient names with the corresponding medical record number. In addition to informing individual patient care, the data is summarised and used for planning, health facilities management and public health initiatives.

LESSONS LEARNED

- Touch-screen technology can be extremely successful because it can mimic paper-based reporting systems with which staff are familiar. Staff with little formal education and no previous computer experience can quickly learn how to use such systems.

- Careful observation of activities is vital for design of appropriate record processes. An initial stage in designing a record system must be to ask staff how they currently keep records. However, observation of activities is also important in establishing accurate details of tasks. In some cases, these observations showed that staff described what they should be doing, rather than what they actually did.

- The system allows rapid compilation of reports for aggregate reporting of data. This means that the system can function as part of a national health management information system as it can easily generate the monthly reports required by that system in the specified format.

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- Patients discharging themselves and taking their records with them reduces the accuracy of the system. Failure to resolve the problem of 'absconding' means that composite statistics, for example on bed occupancy, are inaccurate.
- To be successful, wireless networking needs a reliable connection. Although the workstations have been designed to be portable, staff tend to use them in fixed positions because of the unreliable wireless reception.
- A car battery-based power supply for the workstations is not reliable enough, resulting in 'computer downtime'. Plans are currently being developed to address this.

FUTURE PLANS

These include:

- extending the system to the paediatric department at the Queen Elizabeth Central Hospital in Blantyre. It is hoped this will improve collaboration between the two departments. In turn, this collaboration may make the system one which is transferable to other hospitals and clinics.
- extending the system to other parts of the Central Hospital in Lilongwe, including the surgery and laboratory departments
- formalising the development of relevant pieces of equipment, for example, the power supply.