

# africa's nightmare

by *Sasha Henriques*

## *The Struggle to Protect Medical Workers in Radiological Services*

**A**frica is sharing the benefits of advances in medical imaging technology that make it possible for doctors to more quickly diagnose and treat serious illnesses. But the stunning new machines have brought along some problems of unknown magnitude in the absence of adequate monitoring of staff for radiation exposure; like overexposure of medical staff to ionizing radiation.

As the complement of lifesaving machines grows in African countries, so has this problem. Practitioners say it stems from a number of causes — lack of oversight, insufficient staff, poor equipment, inadequate dosimetry, medical personnel who aren't properly trained, and a lack of guidelines.

The situation affects thousands of workers across the continent, and highlights the need for more training and support.

Over the past six years, the IAEA has trained 107 radiographers and radiologists from 26 African countries in radiation protection. It has also helped 35 of the continent's governments draft radiation protection legislation, and provided detailed guides to states for the application of the IAEA's International Basic Safety Standards on Radiation Protection.

The work is ongoing. Zambia and Kenya, two African countries where officials say more support is needed to control radiation exposures, are receiving help from the IAEA.

Beatrice Mwape, a medical imaging specialist in Zambia's Ministry of Health says "We have a CT

(Computed Tomography) scanner, we are planning to buy an MRI (Magnetic Resonance Imaging) machine. We have ultrasound services and we have a radiotherapy centre. Some of these use radiation. There are also some hospitals with obsolete equipment, which need to be checked almost every month to ensure that the right dosage of radiation is going to the patient as well as to the radiographer. And that is a major problem for us."

There are 150 workers in radiation-related jobs in Zambia's civil service. But officials have no idea how many are in the private sector. These persons remain off the radar and are never monitored for radiation exposure. For those within the Health Ministry's sphere of influence, the IAEA provided Zambia with a Thermoluminescent Dosimeter (TLD) reader in March 2006, and has offered to procure another for the country's health service under a cost-sharing scheme in 2011.

Kenya also struggles to monitor its 5,000 workers in radiation-related jobs at 600 medical facilities. Only about a quarter of these nurses, patient assistants, dentists, radiographers, and radiologists are monitored for exposure.

The IAEA is working with the Kenya Bureau of Standards to standardise radiation measurements. Specialists helped design the country's secondary standards laboratory, which last year began offering calibration of machines involved in radiation monitoring. The IAEA also provided basic equipment, trained essential staff and provided expert advice to the Kenyan authorities.

## Problems Grow Alongside Demand

Dosimeter badges measure the radiation dose to which an individual has been exposed. Not all of Zambia's 150 radiographers in the country's 94 public hospitals have these badges. Even those who do aren't being monitored because of the Radiation Protection Authority's acute personnel shortage.

The Authority is charged with monitoring workers, but its three officers have no proper transport in a country that covers more than 290,000 sq miles. They find the task virtually impossible. "So my radiographers are never monitored," says Ms. Mwape. "And that is a major problem."

Estimates suggest that there are more than 7,000 new cases of cancer in Zambia a year, and 3,600 new cases in Kenya annually. As cancer cases increase, so has the demand for radiation therapy.

In 2003 the Zambian government and the government of the Netherlands provided 25 million Euros to equip 71 hospitals with new X-ray equipment and ultrasound machines. There are plans to purchase more medical imaging equipment, all of which use radiation.

Ms. Mwape says, "We would like radiographers in the provinces to be trained to do inspections, so they can assist the Radiation Protection Board. But more importantly, we need more radiation protection officers. So far, our current crop consists of only diploma holders. There's nobody with advanced training."

The IAEA does offer training, but the majority of Zambian workers aren't qualified to take advantage of it, since the minimum requirement is an undergraduate science degree. Over the past six years, only two workers have qualified for the IAEA's advanced training course.

Dr. Jeska Wambani, Chairman of Kenya's Radiation Protection Board says, "There is no academic institution in our country that offers medical physics as an area of study. The five medical physicists we have were trained abroad." She wants to see a centre set up that would cater to the needs of the East and Central Africa region and train professionals in nuclear and radiation safety.

To date, Kenya has benefited from the IAEA's biannual regional post-graduate educational course on radiation protection and safety of ionizing radiation sources. So far, five officers from the Kenya Bureau

of Standards, the Radiation Protection Board and Kenyatta National Hospital have been trained.

## To the Heart of the Matter

Using poorly calibrated radiotherapy and medical imaging machines has resulted in radiographers and patients in both countries being exposed to unknown amounts of unnecessary ionizing radiation. Both Ms. Mwape and Dr. Wambani agree that more research is essential to determine the true scale of the problem.



**Beatrice Mwape, a medical imaging specialist in Zambia's Ministry of Health, spoke passionately about her country's plight during the IAEA's General Conference in September 2008.**

(Photo: D.Calma/IAEA)

"We don't have national guidelines and standards in diagnostic radiology in Kenya because we don't have enough data," says Dr. Wambani. "And we don't have the data because we lack adequate funds to collect statistical information from hospitals all over the country."

Data is necessary because worker and patient radiation exposure are inextricably linked. Containing patient dose levels will mean lowering doses delivered to medical workers as well. This is where the IAEA comes in.

The Agency's Department of Technical Cooperation is undertaking a project at the Kenyatta National Hospital in the capital Nairobi, and at the Moi Teaching and Referral Hospital Eldoret, a teaching institution outside the capital. Both are being used as model sites where radiation dose information is gathered, analysed and then used to create diagnostic reference levels for Kenya. Dr. Wambani says attempts are being made to expand the project to all the hospitals in Kenya's eight provinces. ☼

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