

# Investing in safety and infection prevention during malaria case management

The Ebola epidemic took the lives of many health workers at the front line  
William R Brieger looks at the measures that can be taken to prevent a repetition

The recent World Malaria Day observances called on all partners to 'invest in the future, defeat malaria'. The word 'investments' brings to mind huge supplies of insecticide-treated nets and malaria medicines. The recent and ongoing Ebola crisis has shown how vulnerable health workers are when trying to diagnose and manage malaria when investments have not been made in safety equipment and training.

## Ebola sets the stage for malaria safety

The Ebola epidemic in West Africa, as well as its predecessors in Central Africa, has taken a disproportionate toll on health workers.<sup>1</sup> In the early stages of the outbreak, health workers regular front line clinics became infected when patients with Ebola, a disease which none had seen before, were initially thought to have malaria or other endemic febrile illnesses.<sup>2</sup>

Contact with the various bodily fluids of these febrile patients during physical examination, including parasitological testing of blood for malaria diagnosis, combined with a lack of personal protection/infection prevention supplies and materials, resulted in many unnecessary health worker deaths. Many clinics closed,<sup>3</sup> while those that remained open saw a drop in clients due to fears from beliefs that the unknown disease was emanating from the clinic.

By 8 October 2014, 401 health workers had contracted Ebola, with 232 confirmed or suspected deaths.<sup>4</sup> Although Ebola infections persist among health workers, these are primarily among those working in special Ebola treatment units. Between 12 January 2015 and 22 March, 35 health workers became infected.<sup>5</sup> As the World Health Organization (WHO) observed, 'Several infectious diseases endemic in the region, like malaria, typhoid fever, and Lassa fever, mimic the initial symptoms of Ebola virus disease. Patients infected with these diseases will often need emergency care. Their doctors and nurses may see no reason to suspect Ebola and see no need to take protective measures'.<sup>6</sup>

These health worker deaths occurred on top of the fact that the 'World Health Organization estimated that over 4 million more health workers are needed to bridge the gap (in human resources for health) - with 1.5 million needed for Africa alone. Across the world, 57 countries have been identified as having 'critical shortages' - 36 of these are in Africa'.<sup>7</sup>

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Now that the epidemic appears to be receding, it is necessary to ensure that health workers do not face such a fate again. In addition, attention is needed to protect others on the front line such as patent medicine shop workers and community health volunteers. A two-pronged approach is needed that combines education/training<sup>8</sup> with a strong procurement and supply system for infection prevention and personal protection materials.<sup>9</sup>

## Infection prevention at the primary care facility

WHO has offered guidance for infection prevention related to Hemorrhagic fevers, and within that has stressed the importance of general protection as follows:<sup>10</sup>

- Strengthen and carefully apply standard precautions when providing care to ALL patients regardless of the signs and symptoms they present with (This is especially important because the initial manifestations of Haemorrhagic fever may be non-specific);
- Hand hygiene is the most important measure;
- Gloves should be worn for any contact with blood or body fluid;
- Medical mask and goggles or face shield should be used if there is any potential for splashes of blood or body fluids to the face, and cleaning of contaminated surfaces is paramount.

Performing Rapid Diagnostic Tests (RDTs) for malaria is the time when most front line health workers could come into contact with a patient's blood. Training materials and job aids (Figure 1), stress the importance of hand washing and use of gloves, but the availability of regular water supplies and disposable gloves in many



*A community health worker performing a rapid diagnostic test on a patient using gloves*

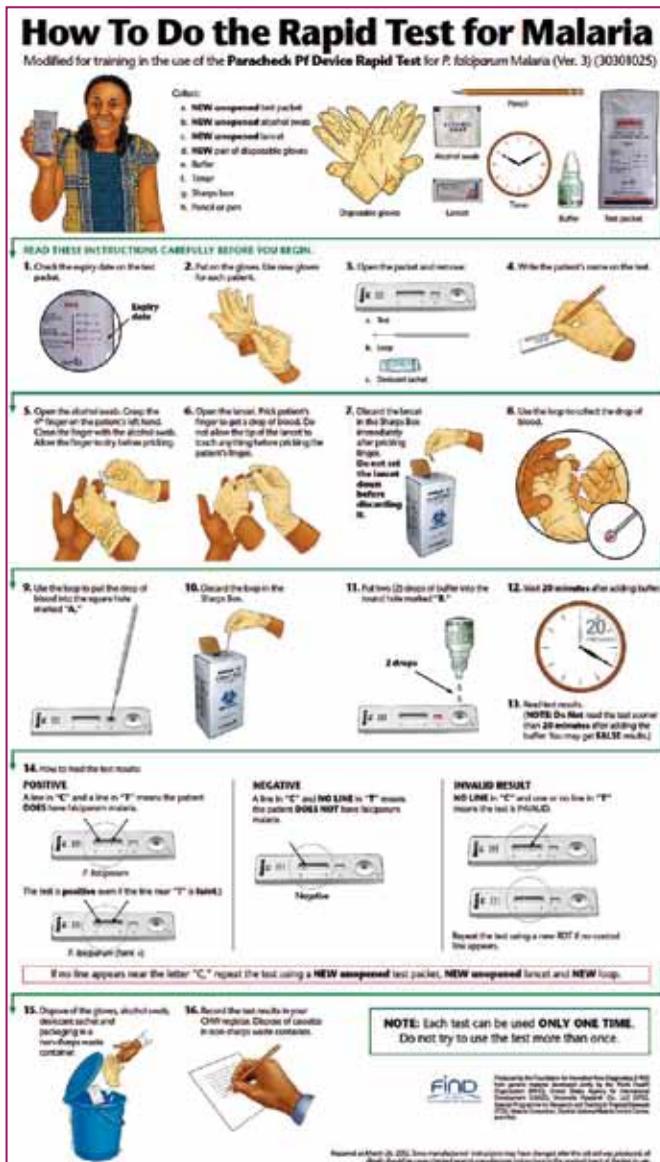


Figure 1: Rapid diagnostic test job aid

front line clinics is low or non-existent.

The US Centres for Disease Control and Prevention (CDC) offers the following guidance for malaria diagnosis and case management in countries where both Ebola and malaria are endemic:

‘Wherever PPE (personal protection equipment) requirements cannot be met, RDTs for malaria should be suspended until either the required level of PPE and appropriate training has been received or the state of the National Ebola Health Emergency has been officially declared to have ended.’<sup>11</sup>

CDC explains further that: ‘Wherever PPE requirements cannot be met RDTs for malaria should be suspended’. Under such circumstances presumptive treatment based on clinical symptoms of malaria is permissible. It is also important to note that even when there is not an outbreak of Ebola, health workers are also at risk from other blood-borne pathogens like HIV and Hepatitis B.<sup>12</sup>

Together the International Labour Organisation and

WHO issued a statement giving more detailed advice on infection prevention to clinic staff as follows:

‘Since other infectious diseases may have symptoms compatible with Ebola Virus Disease, it is important to apply standard measures of precaution in all health care facilities – such as prevention of needle sticks and sharps injuries, safe phlebotomy, hand hygiene, rational use of personal protective equipment, regular and rigorous environmental cleaning, decontamination of surfaces and equipment, and safe management of soiled linen and healthcare waste.’<sup>13</sup>

While non-use of RDTs has previously hinged on health worker attitudes of trusting clinical judgment over test results, today we can see that lack of support for fully equipping health facilities to conduct the tests is a major barrier. Funding for RDT implementation must include procurement of RDT safety supplies such as gloves, other biohazard protective gear and biohazard boxes which aid in prevention of infection.<sup>14</sup>

### Diagnosing malaria in the community

Harvey and co-researchers recognised the growing importance of using volunteer community health workers (CHWs) to provide integrated case management of common illnesses at the community level. Noting the importance of RDT use in differentiating various febrile illnesses, they designed a study to learn how best to guide CHWs from Zambia in safe and effective use of RDTs.<sup>15</sup>

The researchers observed that RDTs come with an insert of instructions from the manufacturer, but they wondered if this was enough to guide a CHW. They tested this idea along with the use of a job aid (Figure 1), and a combination of training and job aid. Concerning the safety issues, they found that 66% using the package insert put on a clean pair of gloves, 86% who used the job aid put on gloves, while 96% who had both job aid and training complied with glove use.

Discarding the loop used to collect the blood in the safety box was practised by 55% using packet insert, 90% who had the job aid, and 100% of those exposed to both job aid and training. Appropriate and safe disposal of gloves and other used materials was practiced by 45%, 76%, and 85% respectively. The lesson here is that investing in educational materials and training pays off in safety.

Hamer and colleagues examined CHW use of RDTs in the field. Eighteen CHWs were trained on RDTs generally but also with attention to ‘infection control measures such as maintenance of aseptic technique, proper biohazardous waste disposal, and avoidance of lancet injuries were also taught. CHWs were given a highly pictorial job aid detailing performance and interpretation of 975 RDTs and disposal of biohazardous waste’. During the study only one CHW accidentally pricked himself and no CHWs reported accidental blood exposure while performing RDTs.<sup>16</sup>

### Malaria case management in the private sector

The Affordable Medicines Facility malaria (AMFm) did



*A health worker demonstrating a rapid diagnostic test use with no gloves*

much to draw attention to the role of the private sector, especially the informal one consisting of ubiquitous medicine shops, in providing artemisinin-based combination therapy (ACT) drugs in the community. What was missing in the original plan was enabling these shop keepers to use RDTs to increase accuracy of diagnosis and rational selling of malaria drugs. A study in Ghana sought to address this gap.<sup>17</sup>

Ansah and her colleagues reported that, 'In this trial, providing RDTs for malaria in the private drug retail sector significantly reduced dispensing of antimalarials to patients without malaria, did not reduce prescribing of antimalarials to true malaria cases, and appeared safe. RDTs should be considered for the informal private drug retail sector'.

As in many RDT studies, the main outcome of interest was use of the test results to guide correct treatment choices. Few report on whether providers, in this case medicine shop staff, followed the ideal procedures for using the tests.

In 2012, Mentor, an international health Non-Government Organisation, began a study on the ability of medicine shop keepers and private pharmacists in Monrovia Liberia to use RDTs and sell ACTs appropriately. The project trained over 100 owners of private sector pharmacies and medicine stores across the slum communities of Bushrod Island and West Point in Monrovia reaching 250 000 people for whom these outlets are often the first point of access to health-care.<sup>18</sup> When Ebola struck and many clinics closed, these medicine shops became even more popular. Unfortunately, about 5 of the workers died from Ebola. For now the pharmacies and shops are not using RDTs, but are treating malaria presumptively.

In conclusion, malaria diagnosis and case manage-

ment at the front line require attention to the health and safety of the health worker - public, private and volunteer. While Ebola has sharpened our concern about acquiring infections during malaria case management, there are other diseases that put the healthy worker at risk if proper infection prevention measures are not taken. Continuous investment in RDTs themselves as well as the safety and protective supplies and treatment is needed. RDTs, if performed properly, can save lives of community members. Infection prevention steps and equipment can save the lives of the health workers who care for the community.

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