July 2015 Volume 37 Number 5

Africa HEALTH



Controlling the last know cluster of Ebola Virus Disease

Seasonal malaria chemoprevention: slow uptake of proven technology

Prevalence and costs of obesity

New medicines, better medicines, better use of medicines

SIEMENS



Siemens Healthcare Diagnostics launches Xprecia Stride Coagulation Analyzer.

A truly handheld portable analyzer for any point-of-care setting

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Building on more than 30 years of central lab hemostasis leadership, Siemens Healthcare Diagnostics is introducing a first-of-its-kind, hand-held portable coagula-tion analyzer. The Xprecia Stride Coagulation Analyzer1 delivers fast, reliable Pro-thrombin time testing (PT/INR) for point-of-care monitoring and management of oral anticoagulation therapy (OAT) with warfarin, a vitamin K antagonist.

More than 800 million PT/INR tests will be administered world-wide this year2 as part of therapy monitoring for patients with a host of conditions, including atrial fibrillation, open and minimally invasive heart valve replacement, deep vein thrombosis, and congenital heart defects, among others. The Xprecia Stride Coagulation Analyzer was specifically designed to meet the growing demand for fast and reliable PT/INR results in physician offices and walk-in clinics to help healthcare professionals make informed decisions about patient care.

Winner of the internationally respected Red Dot Award: Product Design for 2015, the analyzer includes a number of innovations and features not found on most other point-of-care analyzers. No bigger than a large screen smartphone and weighing just 300g, the Xprecia Stride Coagulation Analyzer can be held at any angle and brought directly to the patient's finger for efficient and comfortable blood sample application.

"The Xprecia Stride Coagulation Analyzer is among the most radical, user-friendly redesigns of a point-of-care coagulation analyzer since they became widely availa-ble more than 20 years ago," said David Stein, Ph.D., CEO of Siemens Diagnostics Point of Care Business Unit.
"Our analyzer is designed to be safer, more efficient and more ergonomically friendly than the products available today.

The Xprecia Stride Analyzer uses simple icons and animation in a color display more commonly found in smartphones than medical instruments. Receiving the Red Dot award vali-dates this unique product design and reinforces our efforts to bring a highly usable, lab-accurate coagulation analyzer to the point of care."

To help increase workflow efficiency and usability, an integrated bar-code scanner simplifies data capture for accurate calibration of new lot numbers prior to testing.

The Xprecia Stride analyzer uses fresh capillary (finger stick) whole blood and re-sults are expressed in PT seconds or as a PT/INR (international normalized ratio). It utilizes the same Dade® Innovin® reagent used by Siemens central lab analyzers to minimize any potential for variability. Studies have shown the performance to be equivalent to a reference laboratory hemostasis system3, with results available with-in minutes.

Safety features include a first-of-its kind spring-loaded test strip eject button that allows the user to eject a used test strip and easily dispose of it without touching it, minimizing any potential biohazard exposure.

Other features include easy data transfer to a computer; color display and animated step-by-step instructions to help guide the user during testing. When taken together, all of these innovations become more important as the use of point-of-care PT/INR testing becomes critical to a growing number of procedures and treatments that uti-lize anticoagulation therapy.

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Building bridges

Ebola continues to refuse to lie down and go away. Liberia was 'free' for a few weeks but then a new and as yet unexplained little cluster of cases emerged a few miles north of Monrovia. Meanwhile in both Guinea and Sierra Leone case incidence continues to spike despite all efforts.

Those involved in trying to end the epidemic continue to report significant difficulties in gaining the confidence of communities who are still not convinced that the problem is borne of a rogue virus. People remain confused and upset by being told that they have to forego their usual burial ceremonies etc. Whilst undoubtedly there were mistakes made in the initial efforts to contain the epidemic, (all seem to agree that not enough attention was placed on the importance of engaging the community and its leaders) it is interesting that a long way into this epidemic, with the lessons learned, it is still proving difficult to overcome the suspicion from the community.

As I write the World Health Organization (WHO) has just responded to the Report of the Ebola Interim Assessment Panel which was set up by the agency with a panel of independent external experts to report on the alleged shortcomings by the organization in its response to the Ebola crisis. Its criticism was firm but constructive. What is very clear is that while changes are going to be made, (just look at the WHO website which is now far more informative than it was at the outset of this epidemic) WHO is going to have to change to enable it to take on a more positive role. It needs more funds, better systems and - as the report calls - it needs the support of member states to enable better response. In short, the long-standing enmity between WHO Afro in Brazzaville and WHO HQ in Geneva has got to be bridged. It also means, it needs stronger funding.

The report also highlights how the International Health Regulations are not being taken seriously by many countries. Currently it is 'voluntarily binding' as in every country has a duty to report certain disease incidence, (notifiable diseases) but no one has really been policing whether they do. Intriguingly the Panel goes so far as to suggest 'incentives for countries to encourage countries to notify public health risks to WHO', and goes on to suggest an insurance system which can mitigate against economic effects.

Clearly there is still a long way to go to prevent a similar outbreak happening again, but measures are underway. In this issue we've included a fascinating report on how the final cluster of cases in Liberia was tracked and transmission stopped. It is well worth a read. Alas, six weeks later another small cluster of cases has emerged so Liberia still has work to do. But as a lesson for those who may be faced with such a challenge in the future, it is instructive.



Bryan Pearson
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Remaining Ebola free

Shima Gyoh suggests that it is time for some forward planning - and educating - to prevent another Ebola epidemic taking hold



It was great news when the World Health Organization declared the end of the Ebola Virus Disease (EVD) epidemic in Liberia. We look forward to Sierra Leone and Guinea being also declared free. Since the discovery of the virus in 1976, the medical profession has regarded the dangerous malady as 'endemic' in the tropical rainforests of the Congo. Infections with the virus tended to occur in the small, relatively isolated villages of the forest, associated with the handling of the flesh of forest primates whose unexplained multiple deaths sometimes preceded human epidemics. This partly explains the slow reaction from the rest of the world when Médecins Sans Frontières were struggling to control an outbreak in Guinea. Once it entered the environment with better communications, the virus rapidly spread. Soon, Sierra Leone and Liberia were infected, and Nigeria got it from an air traveller. Although fear of a pandemic was on the cards, the manner of spread indicated that countries with strong health systems could contain the disease and prevent epidemics, and this happened in the USA, Spain and the UK. Nigeria's health system is nowhere near as advanced, but the efficient application of isolation and contract tracing quickly stopped the epidemic, giving much hope that the same could be done in the other West African states.

The statistics indicate that the epidemic will soon end in Sierra Leone and Guinea. Though the virus does not perpetuate itself in the human community in the true sense of the word 'endemic', the region itself will become liable to reintroduction from the zoonotic reservoir, and recurrence can no longer be excluded. The countries must therefore take certain steps to prevent it, and to quickly contain it should it occur. We must strengthen our health systems by providing the basic infrastructure, from abundant potable running water, environmental sanitation with efficient sewage disposal to robust, and functioning primary healthcare accessible to all citizens with no village being in a blind spot. The population would be educated on the dangerous traditional practices detrimental to health. As hand-washing becomes established after the epidemic, shaking of hands, the much loved sign of friendship discouraged during the epidemic, will return. Such developments are affordable to all countries in Africa if their governments get their priorities right.

EVD is extremely dangerous to study, requiring the highest level of biosafety for the laboratory and totally occlusive protective clothing and top skills for the researcher. Its zoonotic reservoir and cycle are not known for sure. Primates and other animals that transmit it to man are themselves highly susceptible and cannot be the true reservoirs. Bats are known to be the zoonotic reservoir for its cousin, the Marburg virus, and certain species of fruit bats have been found to harbour the virus. They have been linked to primary human infection, though largely on circumstantial evidence. The entire West African epidemic was traced to one index case in Guinea, but the story of how the primary infection occurred, published in *Nature*,[1] seems rather speculative. A two year old child 'playing' with bats under a large hollow kola tree hosting thousands of one species of bat got the primary infection. The tree was subsequently burnt down, but all the bats also died in the fire as if they were glued to the presumably dry, burning tree.

'…there were no other representatives of the same bat species in the area, says Fabian Leendertz, lead author of the research team from Robert Koch Institute, Berlin'.[1]

Genetic study shows that the virus has made only one genetic change which enabled it to jump from animal to man. Despite the distance, the virus causing the West African epidemic was found to be of the same clad as the one in the Congo infections. The genetic drift resulting from the massive propagation in the West African epidemic has not adapted it for endemicity in the human host. The unprecedented spread is due to the better communications in the area combined with the weak health structures of the region.

The epidemic spurned accelerated research for treatment and vaccines, and it is hoped that one with a long period of protection, like in yellow fever, would be found. With a mortality rate of about 70%, drug and vaccine trials face huge ethical dilemmas of running controls. Early diagnosis and containment are presently the best means of dealing with the Ebola challenge. It requires upgrading the microbiological laboratories and the handling of investigation for viral infections. Each country should maintain at least one biosafety laboratory of the highest grade (4) strategically located to investigate suspected viral haemorrhagic fevers, of which EVD is only one, and well-equipped isolation hospitals with a core of well-trained staff that can immediately swing into action at short notice.

Shima Gyoh has held many posts ranging from village doctor to DG of Nigeria's Federal Ministry of Health and Chair of the Medical and Dental Council of Nigeria.

Reference

1. Maron D F. New Clues to where Ebola Started. *Nature* 2014; doi:10.1038/nature.2014.16651.

SIEMENS



Siemens adds three new Haematology Systems to its portfolio of scalable Solutions.

The Diagnostics Division of Siemens Healthcare has announced the launch of three new scalable haematology systems: the ADVIA 360 System, ADVIA 560 System, and ADVIA 560 AL System. These lower capacity systems offer state-of-the-art haematology testing capabilities for small to mid-sized laboratories and may also be used as back-up systems for larger laboratories.

Engineered for safety and ease-of-operation, the new ADVIA haematology systems help optimize and manage workflow through several convenient features, such as the choice of open- or closed-tube sampling and customizable result printing. Automatic anti-clogging and cleaning procedures are employed to ensure results reliability. Along with automated maintenance, this reduces manual procedures and biohazard exposure.

The systems offer fast, high quality CBC testing, running up to 60 samples per hour. Other system features include: the option for manual or automatic calibration procedures, a cap-piercing function for accurate and safer sampling, a multilingual operating menu and bidirectional LIS communication for easy patient data transfer between laboratories and minimized paper-based work lists.
"With major differences in haematology testing volumes from laboratory to laboratory and network to network, Siemens' scalable options are critical to meet the needs of our customers," says Stefan Wolf, CEO, Haemostasis, Haematology and Specialty Business Unit, Diagnostics Division, Siemens Healthcare. "We are proud to add these new feature-rich ADVIA haematology systems to our portfolio of analyzers to enable laboratories of all sizes to benefit from reliable, easy-to-use, cost efficient haematology solutions."

With a compact footprint, the ADVIA 360 System allows smaller laboratories to efficiently generate reliable and accurate results while conserving precious benchtop space. This system provides a three-part white cell differential and storage capacity for 10,000 results. An integrated ticket printer streamlines results reporting.
The ADVIA 560 System can serve as the primary haematology analyzer in small to mid-sized laboratories and as a backup for the company's ADVIA 2120i System in larger laboratories. It provides a five-part white cell differential and storage capacity of 100,000 results. Also, two scattergrams and two histograms per result help aid interpreting disease-state information. The ADVIA 560 AL System offers automatic sampling with an optional autoloader that simply plugs into the side of the system for even greater workflow efficiency and true "walk-away" capability.

For further information about Siemens entire family of scalable haematology systems, please visit: www.healthcare.siemens.com/hematology.

For more information contact: nina.swanepoel@siemens.com



Human resources back to top of the agenda

Francis Omaswa provides an insight to the latest human resources for health consultations



The World Health Organization (WHO) has posted a draft of the proposed Global Strategy on Human Resources for Health (HRH) for an online consultation by soliciting comments from stakeholders round the world. At the same time regional face-to-face consultations have commenced with the African meeting taking place in Accra, Ghana. The draft HRH strategy has four objectives, namely (i) Making the best use of the existing stock of HRH; (ii) Anticipating future HRH needs; (iii) building capacity for global and national leadership, governance and management of the HRH; (iv) Ensuring the availability of HRH data, evidence and knowledge to underpin monitoring and accountability at global and national level. The new strategy will be tabled for adoption at the next World Health Assembly (WHA) in May 2016. The question is 'what difference will the adoption of this new Global HRH Strategy make, especially to Africa?'

We already have many such resolutions and policies such as the Joint Learning Initiative (2004), the World Health Report (2006), the Kampala Declaration and Agenda for Global Action (2008), the Recife Ministerial Statement (2013), and a multiplicity of other instruments from past WHA, especially the WHO Code on the International Recruitment of Health Personnel. In Africa we have the 'Roadmap for scaling up the HRH (2012- 2025)', adopted by Health Ministers as well as national HRH Strategies which have been elaborated by the majority of countries as a result of the increased visibility of the HRH agenda, and also as a conditionality for accessing development assistance. I want to encourage us to contribute to the development of the new Global HRH Strategy for the following reasons: (i) it is the instrument that is going to be used for implementing and monitoring the role of HRH in Universal Health Coverage (UHC) and the Sustainable Development Goals (SDGs) that follow the Millenium Development Goals (MDGs) after September 2015. SDG Goal 3 is on Health and Wellbeing; (ii) we should influence this strategy through our comments so that it builds upon all the previous instruments, and above all that it reflects our interests. What are these interests?

The key tenet of Universal Health Coverage is that 'everyone is entitled to basic or essential healthcare as a fundamental human right' within resilient health systems where skilled health workers play a central role. Accordingly, all countries will be looking for skilled health workers, preferably from their own internal sources or from outside their borders. Friends, let me assure you that with the current global demographics, Africa is destined to be a key player in the global health workforce labour market. WHO estimates show that the global HRH shortfall is growing, HRH migration will become the norm and assume mega trends. Ideally this HRH migration as the norm will be regulated and coordinated through instruments such as this Global HRH Strategy and the WHO Code on the International Recruitment of Health Personnel.

Another interest is at country level; while some African countries have made significant progress during the last decade in responding to the call to strengthen HRH, according to the WHO, there are 16 African countries whose HRH status is getting worse in terms of population to HRH density ratios. This is a matter for concern and calls for vigorous action from global and regional partners to provide support to these countries. As the Ebola outbreak in West Africa demonstrated so eloquently, a weak health system anywhere poses a global health security risk to us all. The Global HRH Strategy should therefore ensure global equity so that there are no weak points anywhere in the global health system.

Another and possibly the most important interest is that we in Africa still face major challenges in getting population health recognised as a key priority is assuring human security, social and economic development. The talk among many African political leaders is that the current priorities are infrastructure and energy, and not for example working conditions for HRH. We hope that this new global HRH strategy will provide for an investment case for HRH enabling this matter to become a development and social issue over which elections are won and lost in Africa, as is the case in other parts of the world. It should also provide the case for the global community to see and support Africa in a new way that promotes African ownership and accountability instead of continuing to dish handouts.

Yes, it is possible. I was encouraged to receive reports from African countries who are superior performers in their HRH planning. We were shown HRH information systems that have the potential to ensure that those countries will be right on top of their HRH issues as we move forward. So let's all send our comments on the Draft Global HRH Strategy Workforce 2030 to: workforce2030@who.int

Francis Omaswa, CEO, African Centre for Global Health and Social Transformation (based from Kampala); Founding Executive Director of the Global Health Workforce Alliance.

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The 2014 Namibian Guidelines for Antiretroviral Therapy and The World Health Organization recommend Fixed-Dose Combination Therapy
Consolidated Guidelines on the Use of Antiretroviral Drugs for Treating and Preventing HIV Infection, Geneva, World Health Organization, 2013, (http://www.who.int/hiv/pub/guidelines/arv2013/en)

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Novartis supports pan-African meeting to move faster to malaria elimination



Photo credit: James Gathany, Centers for Disease Control and Prevention

Malaria experts from over 35 African countries came together recently at Novartis's 14th annual National Malaria Control Programme (NMCP) Best Practice Sharing Workshop to discuss the need for new innovative tools and strategies to achieve malaria elimination.

'This discussion could not have come at a better time since we in the Southern African Development Community region are already advanced in the elimination programme having earmarked eight countries in this region as pilots for the elimination campaign,' said Hon. Dr. Nazira Abdula, Minister for Health, Mozambique.



Dr. Linus Igwemezie, Head of the Novartis Malaria Initiative

The three-day workshop with support from international organisations including the World Health Organization (WHO), The Global Fund to Fight Aids, Tuberculosis and Malaria, and the Malaria Consortium, focused on the new WHO 'Global Technical Strategy and Targets for Malaria 2016 – 2030', which aims to accelerate progress in the fight against malaria. The NMCP heads discussed the advances in technology made to date and how these tools can be implemented and improved to achieve the new WHO objective of 90% reduction in malaria cases and mortality rates by 2030.

'Novartis is proud to provide this unique platform,' said Dr. Linus Igwemezie, Head of the Novartis Malaria Initiative. 'These meetings have been designed for NMCP members by NCMP members, to develop new ideas and strategies to achieve elimination of this deadly disease.'

The NMCP meeting comes as the world has reached a critical juncture in the fight against malaria. Malaria mortality rates have fallen by 47% globally since 2001 and this has helped the malaria community gain growing momentum to realise that elimination is possible. Yet, new threats such as inadequate funding, the first signs of drug resistance, and the advance of diseases such as Ebola, could derail efforts unless addressed.

Fountain Africa partner to launch midwives programme in Bungoma

Airtel Kenya has partnered with Fountain Africa Trust to launch a community midwives programme to support expectant women, new mothers and newborns in Bungoma County, Kenya.

The programme offers free calling and sms service to 57 midwives and staff from Fountain Africa Trust, that will enable sharing of information and learning experiences between Bungoma County mothers, themselves, and the County ministry of health officials.

Airtel will also offer 24-hour free internet connectivity for Fountain Africa Trust, giving them unlimited access to online information that will help them carry out their programme effectively and interact with other midwives across the globe.

In a statement, Airtel Kenya CEO Adil El Youssefi said that the company is helping the government attain its Millennium Development Goals 4 and 5 by enabling the midwives to communicate effectively for free, especially when they are faced with emergencies.

UNAIDS welcomes evidence that starting ART early saves lives

UNAIDS welcomes additional evidence that starting antiretroviral therapy (ART) at a higher CD4 level has a positive effect on the health and wellbeing of people living with HIV.

'Every person living with HIV should have immediate access to life-saving antiretroviral therapy,' said Michel Sidibé, Executive Director of UNAIDS. 'Delaying access to HIV treatment under any pretext is denying the right to health.'

The National Institutes of Health-funded international randomised clinical trial START (Strategic Timing of Antiretroviral Treatment) has found evidence that the benefits of immediately starting ART outweigh the risks.

The START announcement follows a series of research findings over the past several years indicating the health benefits of starting HIV treatment earlier. The findings from these studies will play an important role in shaping the new treatment guidance from the World Health Organization due to be released later in 2015.

Ghana halts Ebola vaccine trial

Ghana has halted a plan to test two Ebola vaccines in an eastern town after legislators backed local protests against the trials sparked by fears of contamination, officials said.

The country's Food and Drugs Authority said it had begun enlisting volunteers in Hohoe in the Volta region to be injected with drugs made by Johnson & Johnson and Bavarian Nordic as part of a global Ebola vaccine drive.

Youth leaders threatened to boycott the programme.

Ebola has killed more than 11 000 people in Guinea, Sierra Leone and Liberia since it began more than a year ago, but new cases have declined sharply. Ghana has yet to record a case.

'The health minister has suspended the trials indefinitely because the people said they don't want it,' Health Ministry spokesman Tony Goodman said.

Women and girls in Africa 'being left behind' in fight against HIV/AIDS

Young women and adolescent girls in Africa 'are still being left behind' in the fight against HIV/AIDs, according to a new joint report from the United Nations (UN) and the African Union.

In the sub-Saharan region, AIDS-related illnesses remain the leading cause of death among girls and women of reproductive age.

In order to guide regional and global advocacy, and inform political dialogue on HIV/AIDS prevention and treatment among young women and adolescent girls, UNAIDS and the African Union have launched a joint report entitled, 'Empower young women and adolescent girls: Fast-tracking the end of the AIDS epidemic in Africa'.

The document outlines three political commitments to advance the rights and empowerment of Africa's young women and girls.

The commitments are to stop new HIV/AIDS infections among young women and adolescent girls in order to ensure that AIDS is no longer the leading cause of death among adolescents; to empower young women and adolescent girls through comprehensive sexuality education; and to prevent HIV infections among children and keep their mothers alive.

Physicians and veterinarians must work together to combat health threats, says WMA leader

Dr. Xavier Deau, President of the World Medical Association (WMA), has called for an integrated approach by physicians and veterinarians to combat different types of health threats.

Speaking at a One Health conference in Madrid, organised by the WMA and the World Veterinary Association, in collaboration with the Spanish medical and veterinary associations, Dr. Deau said the world urgently needed such an approach to combat an increasing amount of antimicrobial resistance, but also the threat from re-emerging infections.

He said that human health, animal health, and the ecosystems were interlinked and it needed a coordinated, multidisciplinary approach to address risks that merged at the animal-human-ecosystems interface.

'There is a commonly shared concern that as cross-border human, animal, food and seeds mobility increases, so does the threat of the spread of dangerous pathogens and infectious diseases. More education and more training for the next generation of experts are required. We also need a framework for information-sharing to detect and fill knowledge gaps, and to strengthen inter-disciplinary cooperation.'

Dr. Deau added: 'Our key objectives should be to promote a cross-disciplinary and collaborative approach in order to improve human health and animal well-being. We need to foster scientific research on zoonosis and vector-borne infectious disease. We also must create synergies and facilitate the sharing of data between researchers. And it is important that new scientific findings should be disseminated and translated to anyone who might benefit from them.'

Food and Drug Administration approval needed for HIV drug

ViiV Healthcare, Aurobindo Pharma, and the Clinton Health Access Initiative, Inc. (CHAI) are working together to get dolutegravir 50mg approved by the US Food and Drug Adminisitration (FDA) for the treatment of HIV.

This is the first Abbreviated New Drug Application (ANDA) for a generic version of dolutegravir, less than two years after FDA approval of Tivicay® (dolutegravir) for sale in the US.

Upon receiving Tentative Approval from the FDA, Aurobindo Pharma will be able to supply dolutegravir 50mg via the President's Emergency Plan for AIDS Relief (PEPFAR) programme, following completion of required local regulatory approval process, in the licensed countries outside of the US, as per the agreement signed between Aurobindo Pharma and ViiV Healthcare in 2014.

This submission comes less than five years after ViiV Healthcare and CHAI signed an agreement to collaborate with the goal of bringing innovative formulations of medicines for the treatment and prevention of HIV/AIDS to people in developing countries, on an affordable yet sustainable basis.

Dr. Dominique Limet, CEO, ViiV Healthcare, said: 'This first ANDA for a generic dolutegravir confirms that our strong commitment to thinking and acting differently to pursue new ways to expand access to our medicines, for people living with HIV in countries where the need is most pressing, is working.'

David Ripin, PhD, Executive Vice President, and Chief Scientific Officer, CHAI, said: 'UNAIDS has set global public health goals calling for 90% of those who are HIV-positive to know their status, 90% of those identified to be linked to treatment programmes, and 90% of those in treatment to achieve undetectable viral load. To tackle these complex challenges, targeted efforts to facilitate access to HIV treatment medicines, such as dolutegravir, are needed.'

Mr. N. Govindarajan, Managing Director, Aurobindo Pharma, said: 'We are pleased to be part of this innovative partnership designed to accelerate access to medicines for treating HIV.'

New app for testing eyesight is as effective as optician's test

A smartphone app is as effective at testing eyesight as an optician's clinic, a trial suggests.

The team, at the London School of Hygiene and Tropical Medicine, hope it can transform eye care for millions of people in remote parts of the world.

Trials on 233 people in Kenya, published in *JAMA Ophthalmology*, showed the phone produces the same results as eye charts.

It is often easy to treat with something as simple as a pair of glasses or cataract surgery, but a lot of people are beyond the reach of even the basis eye exam.

The team in London, with colleagues from Scotland, modified a smartphone to develop a series of eye tests that could be used with little training and were easily portable.

The Portable Eye Examination Kit (Peek) uses the phone's camera to scan the lens of the eye for cataracts.

Its 'Acuity App' uses a shrinking letter, which appears on screen, and is used as a basic vision test. It uses the camera's flash to illuminate the back of the eye to check for disease.

The first clinical data from tests in



Photo from http://www.bbc.co.uk/news

Kenya show the vision test gives the same results as the rows of letters pinned to an optician's wall. Their eyes were examined both in their homes and at an eye clinic.

Dr. Andrew Bastawrous, who led the project, said: 'The main reason for most people not getting eye treatment is simply that they don't access the services and that's usually because the services are so far away from them or are unaffordable.

'If we can detect people with visual impairment much earlier on then we have a much greater chance of increasing awareness and ensuring they have appropriate treatment.

The phone is relatively cheap, costing around £300 rather than using bulky eye examination equipment costing in excess of £100 000.

The International Agency for the Prevention of Blindness believes the app could be a 'game changer'.

The Medicines Patent Pool releases 2014 annual report

The Medicines Patent Tool (MPP) released its 2014 annual report in May highlighting significant steps to increase access to World Health Organization (WHO)-recommended HIV medicines in low- and middle-income countries.

The MPP signed three licensing agreements and 17 sub-licensing agreements in 2014, and now holds licenses for 12 antiretrovirals (ARVs) from six patent holders.

Its generic partners have distributed 2.18 billion doses of HIV medicines in 117 countries to date. A United Nations-backed organisation, MPP published its annual 'report card' during the week of the 68th World Health Assembly.

'MPP plays a strong role in supporting overall global health objectives through voluntary licensing agreements that speed development of low-cost, generic medicines to development countries,' said Greg Perry, Executive Director, MPP. 'Twenty Fourteen was a stellar year. We signed licenses with patent holders AbbVie, Gilead Sciences and ViiV Healthcare, and expanded our network of generic manufacturers to ten companies now working on more than 50 medicine development projects.'

MPP estimates that it has saved the international community $79 million through discounted prices of HIV medicines and lower royalty payments, equivalent to one year of treatment for approximately 625 000 people living with HIV globally. Its efforts to spur generic competition for new ARVs could result in an additional 22 million patient-years of ARV treatment and generate between 1.18 billion and 1.4 billion in savings through 2028.

Germany to support Sierra Leone's health sector

The German Federal Ministry for Economic Co-operation and Development, is committing 22 million euro's to further boost Sierra Leone's health service delivery.

Director-General for German Federal Ministry for Economic Co-operation and Development, Gudrun Grosse Wiesmann disclosed this in a media briefing at the conference hall of the Ministry of Health and Sanitation, Youyi Building in Freetown.

Madam Wiesmann said that her government is increasing its involvement in the health sector in Africa, the reason being that most of the local health systems are often weak, coupled with the recent Ebola outbreak in West Africa.

She said the programme will be launched with bilateral development co-operation funds of up to 205 million euro's for the three affected West African states, for 2015/2016, and will focus on training, information campaigns, and equipment.

Rotary grants US$40.3 million to eradicate polio worldwide

The continued fight to stamp out polio will receive an additional $40.3 million boost from Rotary to support immunisation activities and research carried out by the Global Polio Eradication Initiative.

The funding comes at a critical time as Nigeria, the last polio-endemic country in Africa, approaches one-year since its last case of polio. If the current progress continues, the World Health Organization may remove Nigeria from the list of polio-endemic countries as early as September. In addition to the notable progress in Nigeria, no new cases of polio have been reported anywhere in Africa since August 2014.

Experts do, however, strongly caution that it is too soon to fully celebrate. Nigeria needs to go an additional two years without polio to be certified polio-free. Funding and support for high-quality immunisation campaigns and surveillance activities will be key to sustaining current gains.

'We are closer than we've ever been to wiping out polio,' said Mike McGovern, chair of Rotary's International PolioPlus Committee.

Philips transforms Intensive Care Unit in Kenyan hospital

Philips have unveiled an entirely refurbished Intensive Care Unit (ICU) at Machakos Hospital, Kenya.

This is the first of eleven ICU departments in hospitals across the country that Philips is transforming as part of a tender contract awarded to Philips by the Central Government of Kenya to support healthcare revitalisation across the country.

Philips has adopted an approach known as Managed Equipment Services (MES). This approach means that Philips has taken full responsibility for the entire renovation, and has sourced and provided all required facilities, not just the technology and equipment. This also included working with external third parties to deliver all necessary solutions for a world-class ICU.



New formulation of HIV treatment to save children's lives

Children affected by HIV/AIDS will benefit from the decision by the United States Food and Drug Administration to grant approval to a new antiretroviral formulation that can be mixed with food to make it easier for children living with HIV to take the life-saving medicines, UNAIDS and UNICEF have said.

'Treatment innovations such as this that replace unpleasant and bad tasting medicines are a real breakthrough, accelerating access to treatment for children and keeping our youngest healthy,' said Michel Sidibé, Executive Director of UNAIDS. 'It is unacceptable that only 24% of children living with HIV have access to antiretroviral medicines.'

The oral tablets contain an antiretroviral formulation of lopinavir and ritonavir. The treatment is heat stable and more palatable than medicines currently available.

From Abidjan to Addis: Delivering in 2015 for Africa

A new funding plan to deliver basic health and education for everyone is essential to end extreme poverty, according to The ONE Campaign's DATA Report 2015: 'Putting the Poorest First', which was in Abidjan, in the margins of the African Development Bank Group Annual Meetings.

ONE's analysis shows that development partners are missing their targets and financial support for the least developed countries (LDCs) continues to fall. Although LDCs are increasingly home to those who live on less than $1.25 a day, they received less than a third of aid in 2014. Had that share been increased to 50%, an additional $26.5 billion would have been available to those who need it most.

ONE is calling for better-targeted development assistance to be coupled with increased domestic revenues from developing countries' own governments to fund access to basic social services for everyone by 2020.

Investments in agriculture and energy are essential, along with action to clamp down on corruption, curb illicit financial flows, and drive up transparency so citizens can follow the money from resources to results.

Dr. Sipho S. Moyo, ONE's Africa Executive Director, said: 'More than two-thirds of the least developed countries are in Africa; these countries bear a growing share of the world's extreme poor. Decisions taken this year could be transformative for them and shape the course of history.'

The DATA report sets out a five-point plan for the world's poorest to be agreed at the pivotal Financing for Development conference (held this month), which must include access to basic service, increased domestic government revenues, development assistance where it is most needed, sustainable inclusive growth, and strong accountability through a data revolution to ensure that commitments are followed through.

The WHO calls on Africa to increase investment in health systems



The World Health Organization (WHO) has called on African governments to invest more into improving health systems in order to improve the quality of healthcare services.

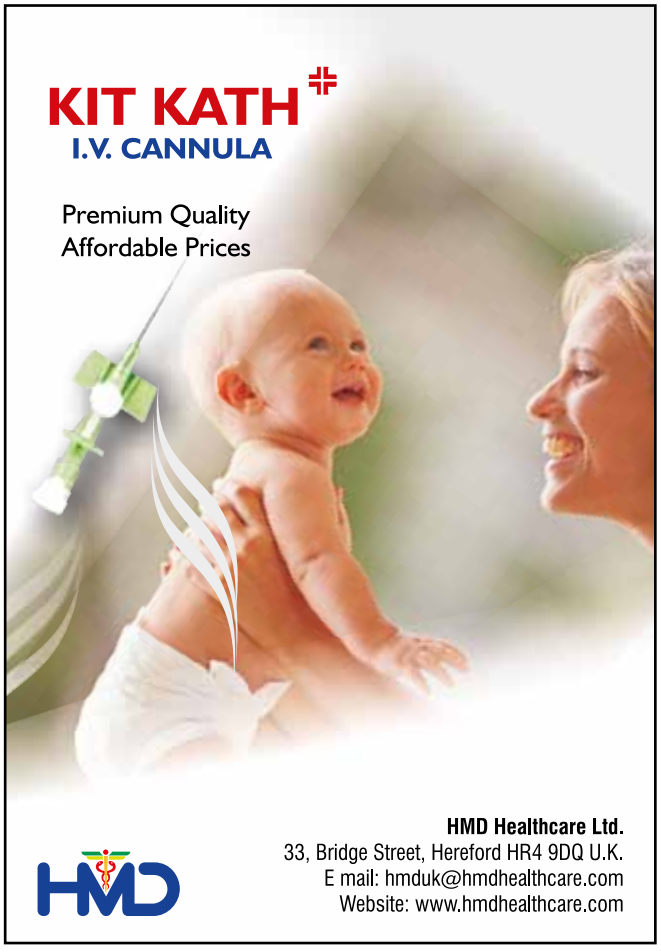
The WHO Director for Africa Matshidiso Moeti, who was on a three-day visit to Zambia, said that funding to health systems in Africa is still below the required threshold, adding that both national governments and cooperating partners should ensure that this is increased.

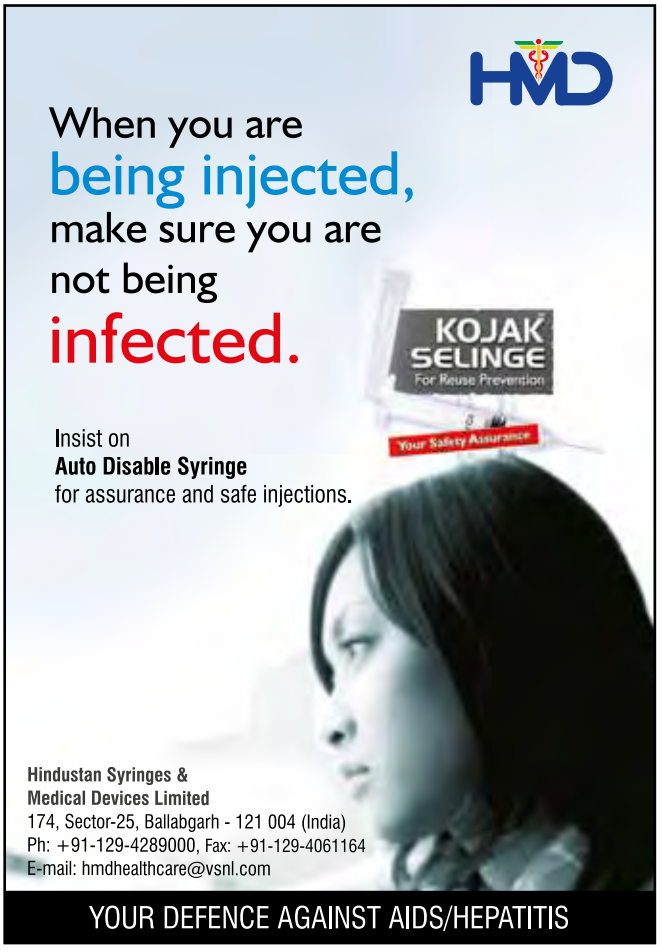
'Africa is facing challenges in dealing with communicable diseases and in recent years, we have seen the emergence of non-communicable diseases and this requires improved healthcare systems. But unfortunately, health care systems are still under-funded in many countries,' she said.

She also said that The United Nations health agency has come up with guidelines that countries could use to embrace herbal medicines so that medicines are integrated in national healthcare delivery systems.

Meanwhile, WHO has commitment itself to continue helping Zambia improve its healthcare delivery system. She said the two parties agreed to work on a partnership that will ensure universal healthcare coverage throughout the country by training more healthcare workers, ensuring sustained provision of medicines, and building infrastructure.

'Zambia still has a big gap in healthcare delivery systems and we agreed that we need to work together to improve the situation. The WHO is committed to help Zambia improve its healthcare system, 'she said.





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Spike in West Africa Ebola cases shows need to address underlying healthcare needs



Photo credit: Dr. Heidi Soeters, Centers for Disease Control and Prevention's team member and EIS Officer

Back in May this year, the World Health Organization (WHO) reported a substantial increase in the weekly total of new Ebola cases in both Guinea and Sierra Leone, and responded by deploying a response team.

This comes in the shadow of the success in Liberia that was proclaimed to be Ebola-free in May, (but they experienced further localised cases in June) the result of a comprehensive response by President Barack Obama and his administration to invest in Liberia's healthcare infrastructure.

The US provided personal protective equipment, funded and trained medical workers, deployed laboratories, supported disease tracing, and started a large-scale social messaging campaign to inform Liberians about practices to protect themselves from infection.

The lesson from West Africa is clear: For their own safety and for the long-term stability of the African economy they need to assist with investments in healthcare infrastructure of West Africa - from hospitals and clinics to medication and vaccines and training doctors and nurses.

With more than 26 000 reported cases of infection and more than 10 000 recorded deaths, the crisis has been the largest and most geographically widespread outbreak of Ebola ever recorded. Beyond its devastating death, the crisis devastated the region's economy.

In March, the United Nations reported that West Africa, as a whole, may lose an average of at least $3.6 billion per year through 2017 due to a decrease in trade, closing of borders, flight cancellations, and reduced foreign direct investment and tourism.

Rainy season is hampering Ebola response in West Africa

The United Nations (UN) and the World Health Organization (WHO) reported an increase in the intensity and geographic area of Ebola transmission in Guinea and Sierra Leone.

They warned that the onset of the rainy season 'from now onwards' will make field operations more difficult, and noted that community engagement remains a challenge in both countries.

Meanwhile, Peter Graaff, the Acting Special Representative and head of the UN Mission for Ebola Emergency Response said the rainy season 'makes things more complicated because for the time being, people showing those symptoms have to be dealt with as if they are potentially Ebola patients, therefore have to be tested'.

As a consequence, he warned that the number of people to be tested for Ebola would go up dramatically over the next few weeks.

As this issue of *Africa Health* went to print, new cases were continuing to be reported from four prefectures of Guinea and three districts of Sierra Leone, and several cases in both countries arose from unknown sources of infection in areas that have not reported confirmed cases for several weeks, indicating that chains of transmission continue to go undetected, according to WHO.

'Rigorous contact tracing, active case finding, and infection prevention and control must be maintained at current intensive levels in order to uncover and break every chain of transmission,' it said. 'However, the onset of the rainy season will make field operations more difficult from now onwards.'

The WHO also reported that response efforts have been complicated by active and passive resistance from communities in Guinea and also Sierra Leone.

'Community engagement has continued to be challenging in several chiefdoms in Kambia, with UNICEF reporting a large number of incidents of resistance to response measures in the district,' according to the update.

State of the art cancer treatment available in Namibia

Namibian cancer patients requiring specialised radiation therapy will no longer have to travel to South Africa for their treatment, with the opening of the new Namibian Oncology Centre equipped with the country's first Elekta digital linear accelerator.

The private Namibian Oncology Centre is set to open in Windhoek later this year. Built and equipped with funding from Spitz Healthcare Investments, the centre will have chemotherapy, laboratory, pharmacy and inpatient facilities, as well as the first digital linear accelerator radiation treatment in Namibia.

The centre's radiation unit, with the capacity to treat up to 50 patients a day, will bring to Namibia highly specialised treatment. The only other radiation treatment available in Namibia is at the state hospital in Windhoek, which uses an older, cobalt radiation unit.

A team of specialists are in place to man the new centre. One of the team's oncologists, Dr. Elré van Heerden, notes that the benefits of the new unit will extend to patients beyond Namibia's borders, as a number of private patients from Angola are also expected to seek treatment at the facility.

Dr. van Heerden believes this is a key benefit of the new Elekta linear accelerator and advanced treatment planning capability. 'This equipment allows for highly targeted radiation treatment with limited damage to healthy tissue. This is crucial in curative treatment in particular, because with the ability to cure more patients, we need to ensure the treatment has as little long-term impact on healthy tissue as possible.'

Martin Noordman, service partner manager for sub-Saharan Africa at Elekta South Africa said the arrival of Elekta's highly advanced linear accelerator in Namibia could ease the burden on the state's oncology facility through a possible public-private partnership in future, as well as delivering a number of benefits to private patients who previously might have had to travel for specialised treatment.

Seasonal malaria chemoprevention (SMC): slow uptake of a proven technology

There is frustration in the malaria community at the serious lack of progress with SMC

Over five years of research went into proving that intermittent preventive treatment of infants and children (IPTi/IPTc) for malaria was not only safe but effective.[1] The World Health Organization (WHO) used this evidence to convene a group of 10 of the potential 16 countries in the Sahel at Dakar, Senegal in December 2012 to orient them to and to plan for the application of IPTi/c during high malaria transmission periods and called it seasonal malaria chemoprevention (SMC).

SMC has been defined as a complete treatment course of amodiaquine plus sulfadoxine-pyrimethamine (AQ+SP) should be given to children aged between 3 and 59 months at monthly intervals, beginning at the start of the transmission season, to a maximum of four doses during the malaria transmission season.[2]

Delivery mechanisms for SMC vary. During the original IPTi/c research a number of sites successfully integrated it with child immunisation programmes.[3,4] The current WHO recommendation is, 'if possible, its delivery should be integrated into existing programmes, such as Community Case Management and other Community Health Workers schemes'.

As we approach the third transmission season since the Senegal meeting it is important to take stock of how far countries have come finding the needed sources, establishing appropriate policies and protocols, and finally, implementing SMC.

National policy

The World Malaria Report (WMR) of 2014 states that, 'Adoption and implementation of IPTi has been slow. Despite the WHO IPTi policy recommendation in 2010 (30) and the IPTi Implementation field guide, published in 2011 (31), only Burkina Faso has adopted IPTi as national policy, and the country has not begun implementation. Reasons for the slow progress are unclear, but may be related to the difficultly in coordinating an intervention across health programmes, the complexity of recommendations, and concerns about parasite resistance to SP'.[5] In addition, the WMR indicates that Chad, Congo, Mali, the Niger, Senegal and Togo had adopted national SMC policies in 2013.

Specifically, the national case management directives from Burkina Faso spell out the nature of SMC. These directives then state that, 'The implementation of the CPS strategy AQ + SP will take the form of campaign and will last 4 days per month during the months of August, September, October and November. The distribution of AQ + SP will be by community distributors (DC) under the supervision of nursing heads of post (ICP)'.[6]

Other countries have also embraced SMC. Nigeria's current national malaria strategic plan mentions that, 'Robust multiple prevention strategies driven by significant scale-up of indoor residual spraying, universal coverage of long-lasting insecticide treated nets, and strategic use of larviciding. Use of IPT with SP for pregnant women will be invigorated while also strategically deploying SMC'.[7]

Mali also addresses SMC in its current malaria plans.[8] *The Graphic Online* reported in 2014 that, 'Ghana had adopted the SMC strategy as a policy and implementation would begin this year in the Upper West Region'.[9]

It is important to note that having a plan or strategy does not translate into having a full-scale national programme. Alternatively, not having policy did not stop pilot efforts. Therefore much of what has been reported to date on SMC implementation has come from pilot efforts by Non-Government Organisations (NGOs) and governments.

Pilot SMC efforts

The London School of Hygiene and Tropical Medicine had been involved in the earlier research on IPTi/c. They reported that in 2014, 'SMC was implemented in Burkina Faso, Chad, Mali, Niger, Nigeria, Senegal, The Gambia and Togo, and a further five countries, Cameroon, Guinea, Guinea Bissau and Mauritania, have plans to introduce SMC. UNITAID recently announced a programme of US$67 million to improve access to SMC in the Sahel in 2015 and 2016'.[10] Some information on



Normally a child with fever is tested, but SMC reduces cases

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action in specific countries has also been reported.

Médecins Sans Frontières (MSF) implemented in Niger for the first time in 2013. It is now part of efforts under the national programme to control the disease. 'July to October 2013, MSF conducted a mass campaign, targeting more than 206 000 children from 3 to 59 months of age in more than 1045 villages in the Magaria, Madaoua, Bouza, Madarounfa, and Guidam-Roumji Health Districts of Zinder, Tahoua and Maradl Regions.'

In Niger a variety of distribution methods were carried out. More than 2000 community workers were deployed at 179 sites based within health facilities or public places, 75 advanced sites in the homes of village chiefs, or in hamlets, and by 99 teams going door-to-door.[11] The three distribution strategies resulted in a coverage rate of more than 85%.



The malaria transmission period happens in Burkina Faso's rainy season

The Public Library of Science Medical Journals' Community Blog reported in April 2013 on MSF efforts for SMC in Mali and Chad.[12] It was said that MSF clinics experienced higher caseload in the rainy season from July to November when children under 5 years of age each contracted malaria two to three times. The pilot required extensive negotiations with government since SMC had not yet been adopted as policy.

In Mali, both door-to-door and fixed site distribution of SMC was used, while Chad used only fixed sites. As a result of the intervention, 'In-hospital mortality attributed to malaria fell from 14.5 to 4 deaths per week'. The programme in Mali covered the whole district of Koutiala, providing chemoprevention to an average of 159 317 children per month for three months. In contrast action in Chad covered an average of 10 231 children per month over four months. Koutiala's population is roughly estimated at 575 000,[13] so that the reported monthly coverage appears to be quite good.

By October 2014 MSF continued its third annual SMC distribution and spread to two districts. At this point some 80 000 children in remote parts of Moissala and Bouna received monthly doses during the rainy season. This project was said to result in '60% of malaria cases in children under five years old'. Based on evidence from these projects, SMC has now been integrated to the national plan against malaria in Chad, 'although it has yet to be implemented by any organisation other than MSF'.[14]

Other SMC pilot efforts are being planned. Malaria Consortium reports that it is, 'implementing and assessing the feasibility of a community-based seasonal malaria chemoprevention project in Katsina State, northern Nigeria, with funding from the Bill & Melinda Gates Foundation'. The pilot was to roll-out in the malaria transmission season of 2013, with the preparation of over 2800 healthcare staff, trainers and supervisors who were to roll-out the intervention.[15]

Ultimately around 485 000 children received preventive drugs for malaria in Katsina State, according to Malaria Consortium. They report that, 'The roll-out has shown that SMC can be successfully deployed in a cost-effective and feasible way in areas where the malaria transmission season is less than four months'.[16]

Malaria Consortium eventually expanded and in the upcoming season plans to reach 792 132 children under five years old in Zamfara and Sokoto states in 2015.[17] This expanded effort is part of a new multi-country programme called 'Achieving Catalytic Expansion of Seasonal Malaria Chemoprevention in the Sahel (ACCESS-SMC)', a UNITAID-funded project led by Malaria Consortium, in partnership with Catholic Relief Services (CRS). The ACCESS-SMC programme is aimed at seven West African countries: Burkina Faso, Chad, Guinea Conakry, Mali, Niger, Nigeria and The Gambia.

The Point Newspaper, Banjul, The Gambia reported on 22 January 2015 that 'a new component of the National Malaria Control Strategy commonly called SMC has been launched in The Gambia, mainly for children aged 3-59 months old'. Several partners are involved including 'CRS in collaboration with the Ministry of Health, UNICEF, WHO, and Medical Research Council'.[18] The Gambia has reduced malaria incidence by 85%, so SMC would augment these gains.

The West African Regional Network (WARN) of the Rollback Malaria Partnership (RBM) reported at a regional meeting in 2014 that six countries had implemented SMC, with a coverage rate in 2013 ranging from 10% to nearly 100% of the children under five years of age in the chosen pilot areas.[19] The biggest challenge was resource mobilisation for drugs and operational costs. Although a variety of community-based communication channels were used, countries agreed that the public needed to be better informed about SMC. The countries also reported challenges related to collecting and maintaining accurate data on SMC that was integrated with other aspects of malaria and healthcare programming.

Lessons learned for scaling-up and sustaining SMC

It is encouraging that all the evidence created through the Research Consortium on intermittent preventive treatment of malaria for infants and children eventually resulted in a practical intervention that is beginning to save children's lives in the countries of the Sahel in Africa. While the concept has now been proven in theory and practice, the level of implementation still needs to



Village health workers in Burkina Faso are able to distribute SMC where needed

be scaled-up.

Countries have experimented with various SMC delivery modes. Though WHO has recommended integration into community case management efforts, there is little so far to report on the value of this approach. It appears that community volunteers are important, but the present efforts appear more focused on a campaign-like mode during the high transmission months.

SMC does require additional resources, which may explain why to date it has not spread far beyond pilot efforts. Assistance from international organisations like UNICEF and UNITAID, and private sources like the Gates Foundation are helping these pilot efforts. In order to scale-up though, countries need to incorporate SMC into their national malaria strategies and action plans in order to receive greater financial support through the Global Fund's new funding mechanism.

Policy change does take time, but children's lives are at risk. Therefore it is not surprising that the NGO sector has taken the initiative and is pushing for change by demonstrating the worth of SMC through various pilot programmes. Ultimately, NGOs and governments need to collaborate to bring about enabling policies and funding to scale-up the pilot efforts.

One should also ask whether SMC will be implemented in the Southern African belt of low transmission that corresponds with the Southern Africa Development Communities' eight front line malaria elimination countries.[20] Finally, as sustained intervention in current high transmission areas brings down caseloads, SMC may in future find its way toward the middle of the continent.

In conclusion, it appears that SMC is being planned or implemented in most of the 16 appropriate countries. Hopefully by this time next year better data will be available to report more results on the actual portions of at risk children who are being reached with SMC on a regular basis during the rainy season in the Sahel.

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Controlling the last known cluster of Ebola Virus Disease

Before the latest localised outbreak, Liberia was declared free of Ebola in May. This is the fascinating story of how transmission was finally terminated

As one of the three West African countries highly affected by the 2014–2015 Ebola Virus Disease (EVD) epidemic, Liberia reported approximately 10 000 cases.[1] The Ebola epidemic in Liberia was marked by intense urban transmission, multiple community outbreaks with source cases occurring in patients coming from the urban areas, and outbreaks in healthcare facilities (HCFs).[2,3] This report, based on data from routine case investigations and contact tracing, describes efforts to stop the last known chain of EVD transmission in Liberia. The index patient became ill on 29th December 2014, and the last of 21 associated cases was in a patient admitted into an EVD treatment unit (ETU) on 18th February 2015. The chain of transmission was stopped because of early detection of new cases; identification, monitoring, and support of contacts in acceptable settings; effective triage within the healthcare system; and rapid isolation of symptomatic contacts. In addition, a 'sector' approach, which divided Montserrado County into geographic units, facilitated the ability of response teams to rapidly respond to community needs. In the final stages of the outbreak, intensive coordination among partners and engagement of community leaders were needed to stop transmission in densely populated Montserrado County. A companion report describes the efforts to enhance infection prevention and control efforts in HCFs.[4] After 19th February, no additional clusters of EVD cases have been detected in Liberia.* On 9th May, the World Health Organization (WHO) declared the end of the EVD outbreak in Liberia.

Evolution of the cluster

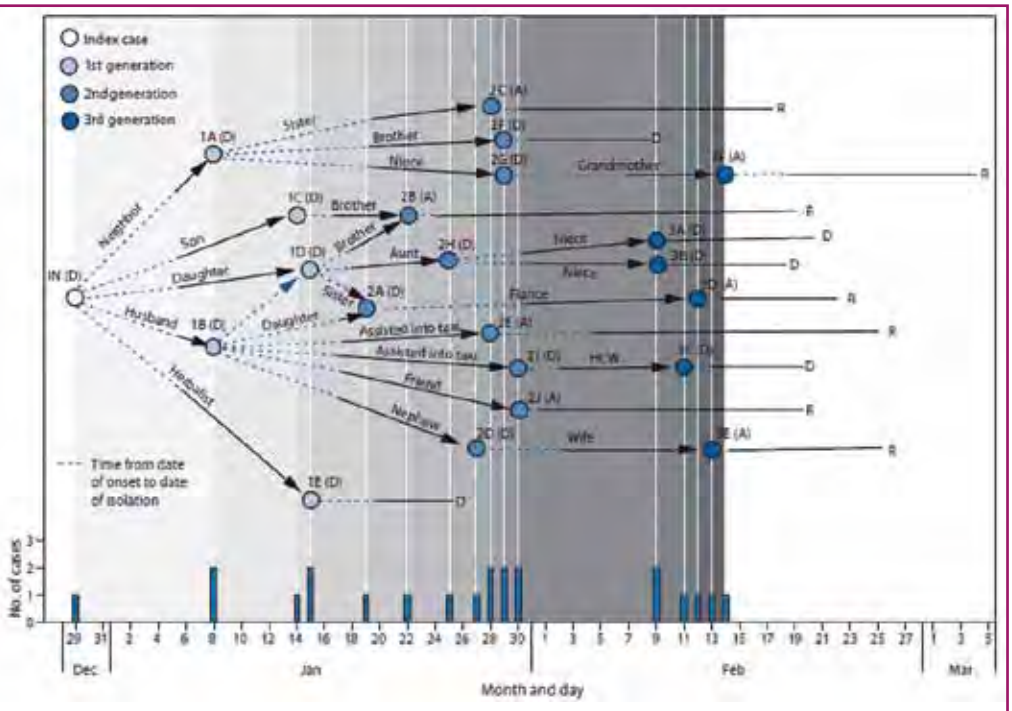
The index patient in this cluster was a woman aged 50 years who became ill on 29th December 2014, in a community near St. Paul River Bridge in Montserrado County (Monrovia). After seeking care from an herbalist in her community, the patient presented to an HCF on 4th January with high fever, red eyes, and cough. EVD was suspected, but she refused referral to an ETU and was sent home with antibiotics and antipyretics. On 5th January, she was admitted to an ETU and died later that day. A postmortem swab of oral fluids tested positive for EVD by polymerase chain reaction. Her family reported no known contact with other EVD patients, although other EVD cases had been reported in the same neighbourhood. In addition, before her illness, the woman had travelled to Grand Cape Mount County, where EVD transmission was ongoing.

Over the following 7 weeks, 21 additional persons with laboratory-confirmed EVD were linked to this case: 11 family members, six neighbours, two community members, one healthcare worker, and an herbalist (Figure 1). These cases occurred in three generations, all epidemiologically linked to the index case. The time interval from onset of illness to admission to an ETU decreased with each generation of cases. Twenty patients (including the index patient) received treatment at an ETU, including 13 patients who died. The two associated EVD-infected persons who did not seek care in an ETU died in the community. Five first-generation patients were admitted to an ETU on average 6.0 days (range = 2–11 days) after illness onset. Ten second-generation patients averaged 4.7 days (range = 1–11 days) from symptom onset to ETU admission or death in the community. The six third-generation patients averaged 1.5 days (range = 0–4 days) from symptom onset to ETU admission (Table 1). The case-fatality rates among the successive generations were 100%, 60%, and 50%, respectively. Probable transmission for 18 of the cases (86%) occurred within 1 kilometer of St. Paul River Bridge in Montserrado County, whereas transmission for three cases occurred near Red Light, 15 kilometers southeast of St. Paul River Bridge (Figure 2).

Five patients worked in an HCF, three as cleaners (1A, 2C, and 3D) and two as healthcare providers (3A and 3C). However, the cleaners and one health care provider (3A) had significant household exposures with persons with confirmed EVD that could account for their infection (Figure 1). One patient (1B) travelled to Red Light while symptomatic, became incapacitated in the community, and exposed two persons (2E and 2I) who assisted him into a taxi. One of these men later exposed patient 3C, a healthcare provider working in Red Light.

According to information provided by patients or their family during case investigations, several symptomatic patients sought care in counties outside of Montserrado to conceal their illness or obtain more affordable medical care. Patient 2A travelled from Montserrado to Bomi County to seek care at an ETU; 2G travelled to Bomi County to access an affordable appendectomy, but was turned back at a county checkpoint; 2H travelled from Montserrado to Lofa County and was transported by ambulance to an ETU in Bomi; and 2D,

Tolbert Nyenswah, Mosoka Fallah, Sonpon Sieh, Karsor Kollie, Moses Badio, Alvin Gray, Priscilla Dilah, Marnijina Shannon, and Stanley Duwor, all from the Ministry of Health and Social Welfare, Liberia; Chikwe Ihekweazu, Thierry Cordier-Lasalle, Shivam A. Shinde, Esther Hamblion, Gloria Davies-Wayne, Murugan Ratnesh, and Christopher Dye, all from the World Health Organization; Jonathan S. Yoder, Peter McElroy, Brooke Hoots, Athalia Christie, John Vertefeuille, Sonja J. Olsen, A. Scott Laney, Joyce J. Neal, Thomas R. Navin, Stewart Coulter, Paran Pordell, Terrence Lo, Carl Kinkade, and Frank Mahoney, all from the Centers for Disease Control and Prevention.



Abbreviations: D = dead; A = alive; R = recovered.
* In this transmission network diagram, date of onset of Ebola symptoms of confirmed cases (dot) is followed by a period of infectiousness (dotted line); time from date or isolation or safe burial to onset of the next generation case (black arrow); and time from date of isolation or safe burial to final disposition (solid black line). Dot colour represents generation. Cases are identified by a two character abbreviation: generation number and sequential lettering based on onset date. Survival status is indicated after each case abbreviation.

*Figure 1: Transmission diagram for the last known cluster of Ebola Virus Disease cases (N=22) - Liberia, 29th December 2014 - 5th March 2015**

to avoid detection, travelled to Margibi County under a different name, sought care twice from a non-ETU HCF, and died there in the community (Figure 1). His wife (3E) resided in Margibi County and became infected while caring for him. At least eight patients sought care at non-ETU HCFs before their EVD diagnosis in nine facilities in Montserrado County and one in Margibi County, exposing a total of 166 healthcare workers.[4]

In several instances, challenges with HCF triage contributed to missing patients with suspect or probable EVD. One patient (1A) tested positive for malaria and was sent home from an HCF. One initially afebrile patient (2G), with clinical symptoms consistent with appendicitis or pelvic inflammatory disease, received care at two clinics and was hospitalised at a third facility for 7 days before being transferred to an ETU. A symptomatic, high-risk contact (3C) under daily monitoring, presented for care at an ETU but was sent home despite a history of exposure to body fluids of a confirmed EVD patient because his temperature was <100.4°F (<38.0°C). Two days later, he presented with symptoms at the non-ETU HCF where he worked and was sent to an ETU, where EVD was confirmed.

Contact tracing identified 745 contacts for this cluster over the 6-week period, including the 166 healthcare workers from 10 HCFs.[4] During the response to this cluster, considerable efforts were made to address the needs of high-risk contacts (e.g., those with documented exposure to body fluids of persons with confirmed EVD). In some instances, contacts agreed to home-based quarantine, and groups of contacts agreed to facility-based observation (i.e., direct daily symptom and temperature monitoring in an HCF), where they could be immediately isolated if symptoms developed, without risk of community transmission. Incomplete contact tracing contributed to the persistence of this cluster; only 15 (68%) of the cases were in persons listed as known contacts; 60% of first and second generation and 100% of third generation cases were in persons who were known contacts (Table 1). Several patients in the cluster denied EVD symptoms or exposure to persons with confirmed EVD when seeking care, reportedly because of fear of community stigma and apprehension of ETUs. At least one child (1D) was hidden from contact tracers when they visited. Persons who initially presented to non-ETU HCFs were less likely to be listed as contacts; two (25%) of eight persons who initially presented to non-ETUs were known contacts, compared with 13 (93%) of 14 who first presented for care at an ETU. Although guidance called for immediate isolation of symptomatic contacts, nine (75%) known contacts were isolated ≥2 days after symptom onset. The last confirmed case in this cluster (3F) was in a person admitted to an ETU on 18th February and discharged on 5th March. The last cluster-associated contacts who did not become ill exited monitoring on 11th March.

Discussion

This network of EVD transmission in Liberia illustrated numerous challenges that persisted throughout the epidemic: fear of stigmatisation in the community, delays in seeking treatment, inadequate triage in HCFs, lack of recognition of EVD cases, and incomplete identification and follow-up of some contacts. The motivations

Characteristic	Transmission generation			
	Total (N=22)*	1st (n=5)	2nd (n=10)	3rd (n=6)
Average age (years) (range)	36 (10–60)	32 (10–60)	34 (13–55)	41 (24–58)
Average no. of symptomatic days in the community (range)	4.2 (0–11)	6 (2–11)	4.7 (1–11)	1.5 (0–4)
Female	12	2	5	4
Survived	7	0	4	3
Transmission location				
Montserrado County, Sector 2	18	5	8	4
Montserrado County, Sector 4	3	0	2	1
Margibi County	1	0	0	1
Initially listed as contact	15	3	6	6
Visited non-ETU while symptomatic	8	2	4	1

Abbreviation: ETU = Ebola treatment unit.
* Includes index patient.

Table 1: Characteristics of patients with Ebola Virus Disease (EVD) in the last known cluster of EVD (N=22), by transmission generation - Liberia, January - February 2015.*

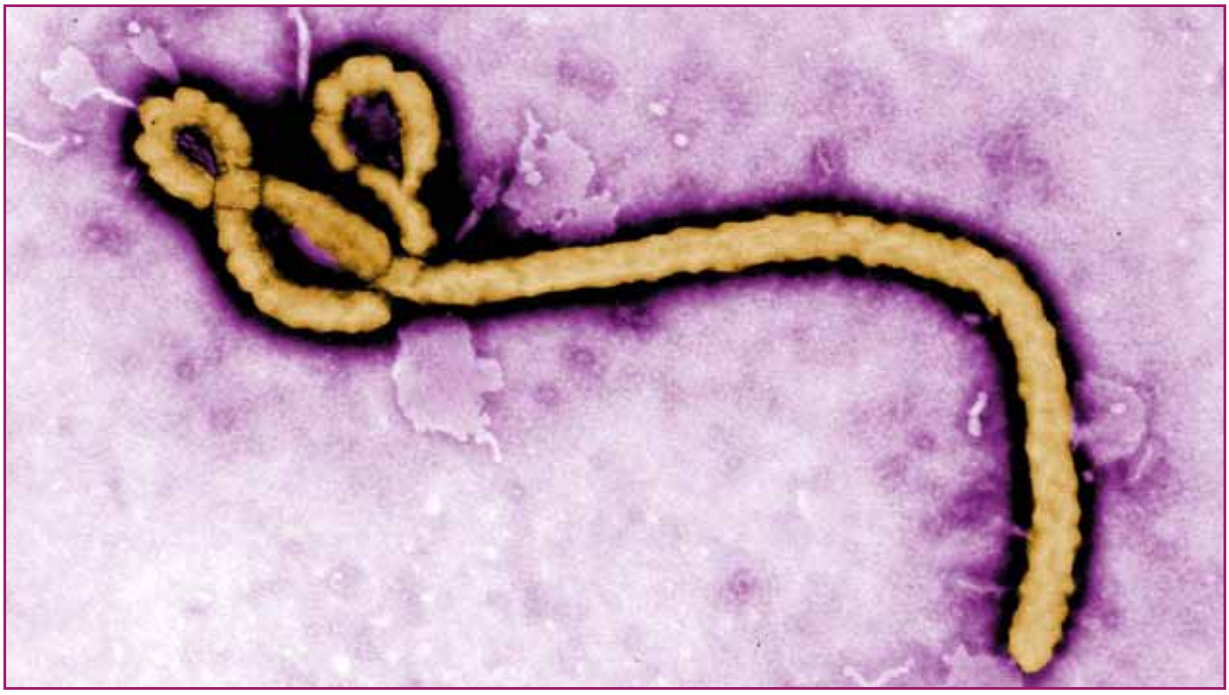
for denying EVD symptoms and resisting treatment are complex, but include stigma, fear, and denial related to possible EVD infection, mistrust of ETUs, and low medical literacy. Despite the widespread availability of ETUs in Montserrado County, some persons opted for care at distant ETUs or care in non-ETU settings, where, consequently, large numbers of healthcare workers were exposed. Delayed treatment might have contributed to worse outcomes in the first two transmission generations compared with the last generation, when patients sought care more promptly. Triage systems did not fully prevent EVD patients from being admitted to HCFs rather than ETUs. Despite these challenges, the last cluster of EVD in Liberia was controlled because of successful implementation of known effective EVD control strategies, including early detection of new cases; identification, daily monitoring, and support of contacts in acceptable settings; effective triage within the healthcare system; and rapid isolation of symptomatic contacts.[2,3]

To improve case investigations and contact tracing, Montserrado County had coincidentally decentralised management of outbreak activities in the four geographic sectors. This decentralised, 'sector' approach might have reduced the risk for community transmission. Each geographic sector had multidisciplinary teams led by coordinators located in each sector to manage and coordinate outbreak response activities at the sector, zone, and block level. Sector teams were empowered to make decisions related to control activities locally, and this enabled flexible adaptation of accepted outbreak control principles to fit local circumstances. Strategies included the use of home-based and community quarantine and facility-based observation, with provision of basic needs and psychosocial support, active case-finding, and outreach to religious and community leaders to allay the fears of affected households and community members. Although decentralisation of sector management presented initial communication and coordination challenges, the enhanced sector-based efforts resulted in more complete contact tracing, more prompt isolation of symptomatic patients in the second and third generations of transmission, increased survival, and reduced transmission in the community.



* N=21 for Montserrado County; one other case in this cluster of 22 cases occurred in Margibi County.

Figure 2: Ebola Virus Disease (EVD) cases (N=21) in the last known cluster of EVD, by location and transmission generation - Montserrado County, Liberia, January - February 2015.*



Micrograph of Ebola Virus Disease transmission electron

As the threat of EVD wanes, much needed non-EVD health services are resuming in Liberia. However, comprehensive triage for EVD[3] and appropriate personal protective equipment (PPE) are crucial but cannot completely eliminate risk for EVD transmission at HCFs. At least eight cases in the cluster described in this report were in patients who sought care at non-ETU HCFs; six (75%) of these were not listed as contacts, highlighting the critical importance of comprehensive contact tracing. These eight patients were treated by HCFs despite the universal requirement of triage. At least four patients in this cluster did not have fever when presenting for care; some HCFs and contact tracers used lack of fever as a de facto indicator to rule out EVD (i.e., rather than completing a comprehensive triage), highlighting the limitations of temperature-based triage. Conversely, many non-EVD patients had illnesses that met the case definition but could not be tested without transfer to an ETU, where care for their non-EVD medical conditions would not be offered. Despite these challenges, only one of the exposed healthcare workers in this cluster became infected with EVD, and no additional transmission occurred in HCFs, possibly because of timely, targeted infection prevention and control training and provision of PPE.[4] Additionally, the most recent EVD patient was appropriately triaged to an ETU when she presented to a non-ETU HCF.[5]

In contrast to earlier in the EVD epidemic, sector-based intensified contact tracing and in-depth case investigation, widespread infection prevention and control efforts,[3] and coordination of case investigation and contact tracing activities between Montserrado and other counties[6] were key to stopping this final chain of EVD transmission. The risk for re-introduction of EVD into Liberia will remain high as long as transmission continues in the region. National efforts to strengthen surveillance, alert and response, border screening, and triage and infection prevention and control in HCFs are high-priority activities in the government of Liberia's recovery plan.

* Another single case occurred in a person who received a diagnosis of EVD on 20th March 2015, and was not connected to this cluster.[5]

Acknowledgments

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Prevalence and costs of obesity

Tim Lobstein

Abstract

Obesity has become a worldwide epidemic. Its prevalence among adults and, especially, children has risen dramatically in a single generation. A high prevalence affects nearly all affluent countries and is rapidly increasing among more affluent populations of poorer countries. The burden of ill health that results is already significant and due to rise, putting greater burdens on hard-pressed health services, an increasing burden on families and social support services, and reducing the productivity of national economies.

Keywords BMI; costs; economic; overweight; prevalence

What's new?

- The prevalence of obesity is rising rapidly in developing countries
- In 2010, one-third of adults globally were overweight
- 70% of middle-aged adults are overweight in the UK
- Medical costs of related ill health cost the UK £5bn and the USA $150bn annually

Definition of obesity

Practitioners and researchers should take care in the definitions of obesity and overweight, especially in the case of children whose weights, heights and related measures will be changing during normal growth. For adults, the classification used by the World Health Organization based on body mass index (BMI) is widely used (Table 1). For children, national growth charts or charts available from the World Health Organization[1] can be used, while for surveillance purposes many surveys use an international set of thresholds for defining overweight and obesity,[2] based on the BMI of children aged 2–18 years.

Besides using BMI, adiposity may also be estimated using waist measurements or skin-fold measures. Without a detailed examination, such indicators of adiposity are only estimates and are of most value when summarizing obesity prevalence in population groups and showing their trends over time. Individual cases should be examined for high levels of muscle mass, stunted growth or other potential causes of misclassification.

Prevalence

The prevalence of overweight (BMI >25 kg/m^2) and obesity (BMI >30 kg/m^2) has increased dramatically in many developed economies, led in time by the USA but followed by other countries. Globally, one-third of all adults were estimated to be overweight by the year 2010.[3] The highest prevalence of obesity is seen in a number of small communities, including some Pacific Islands, Malta, Mauritius and the Gulf States, where as many as half of all adults may be obese. Figure 1 shows the rapid rise for several middle-income countries where repeated surveys are available. It should be noted that the data provided by some countries may be based on heights and weights self-reported by adults through questionnaires and interviews, whereas data from other countries may be based on nurses weighing and measuring adults. There is good evidence that self-reported data tend to underestimate actual BMI (with women tending to underestimate their weight and men tending to overestimate their height).[4] All surveys may also underestimate the prevalence of obesity if the heaviest people opt out of the process.

Rising levels of obesity in developing economies are found especially in urban areas where the population is most likely to be exposed to 'Westernized' diets and lower demands for physical activity. In India, the national Family Health Surveys show that obesity affects about 1% of adult women in rural areas, whereas in urban areas it affects over 6%; in South Africa, the Demographic and Health Survey shows that obesity affects 20% of white men although only 10% of men in all other racial groups.

Adult obesity is most common in later middle age. Data from the 2011–2012 Health Surveys for England[5] show that overweight is most common in adults aged 55–75, with a small decline in prevalence among older people (Figure 2). The rise during adulthood can be explained by the well-known difficulty in losing weight once gained. Figure 2 also shows equivalent data for 1993–1994, indicating similar age-related patterns, but with generally lower levels of overweight and especially a steeper decline after age 75. The decline in BMI in later old age has virtually gone, possibly as the earlier, leaner cohorts give way to

Classification of adult weight status

	BMI[a] cut-off points
Underweight	**<18.50**
Severe thinness	<16.00
Moderate thinness	16.00–16.99
Mild thinness	17.00–18.49
Normal range	**18.50–24.99**
Overweight	**≥25.00**
Pre-obese	25.00–29.99
Obese	**≥30.00**
Obese class I	30.00–34.99
Obese class II	35.00–39.99
Obese class III	≥40.00

[a] Body mass index (BMI) is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2).

Source: World Health Organization (www.who.int).

Table 1

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Competing interests: none declared.

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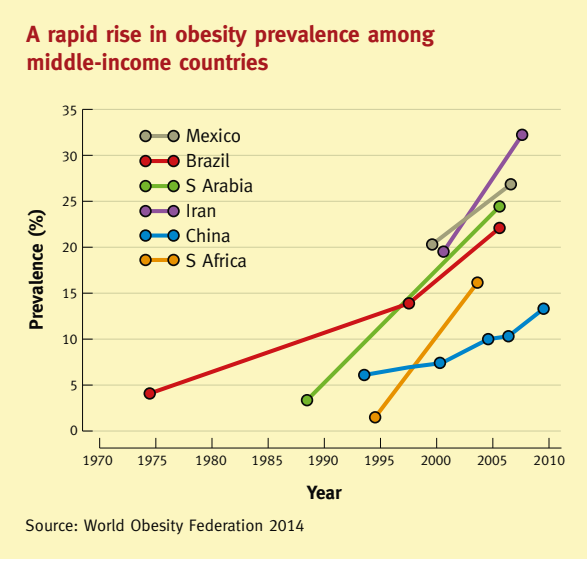


Figure 1

modern, fatter ones. While BMI tends to remain stable after age 65, waist circumferences still increase, indicating greater amounts of body fat and less muscle mass in older people.

In developed economies, obesity is more common among adults in households with lower income, or lower educational or employment status. The socioeconomic gradient of obesity is particularly steep for women: in England, in 2012, 19% of women in the richest fifth of households were obese, while in the poorest fifth of households 31% of women were obese.[6] The gradient of prevalence with social deprivation is most marked for extreme obesity. In the UK, a BMI $\geq$40 kg/m^2 is three times as common in the most deprived sectors compared to the least deprived. Not only is a difference in income level a predictor of obesity prevalence, but so is the size of that difference: countries with the most unequal distributions of income experience a higher prevalence of obesity at all income levels.[7] This association between social inequity and obesity has also been found for children.[8]

As with adults, adiposity among children has reached epidemic proportions. Taking Europe as a whole, some 20% of children are overweight or obese, and in North America the figure is above 30%.[9] This reflects a very rapid, recent rise: data from the Health Survey for England show the proportion of children affected rising from 7% in the early 1980s to 28% by 2012. Interestingly, the rise in child obesity witnessed in many regions since the 1980s may be easing in some countries: the USA, Sweden, the UK, Switzerland and France have all reported a recent levelling of the previous upward trend in child obesity.

Costs

It is now widely recognized that poor diet and lack of physical activity are the cause of more chronic disease and premature death than tobacco smoking.[10] Estimates of the relative contribution from different risk factors to the total health burden of Western European countries are shown in Table 2. Note that the risk factors overlap considerably, with dietary risks (primarily low fruit and vegetable consumption, high sodium consumption) overlapping with high blood pressure, and low physical activity overlapping with high BMI.

Healthcare costs

The expenditure involved in treating obesity appears to be greatly outweighed by the costs of treating its secondary medical consequences. Pharmaceutical treatment of obesity alone can cost some £400 per patient per year, while obesity surgery can cost several times this amount. In the UK the number of prescriptions for one of the treatment drugs, orlistat, rose from 18,000 in 1998 when it was licensed, to 650,000 in 2005,[11] and has continued above 550,000 per year since. A UK parliamentary

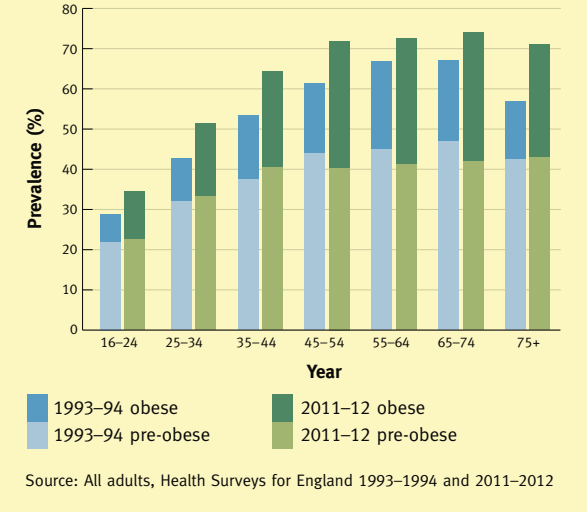


Figure 2

Health burden attributed to different risk factors, Western Europe

Risk factor	Contribution in DALYs[a]
Dietary risks (primarily lack of fruit and high sodium)	14.2 m
Tobacco smoking	11.8 m
High blood pressure	10.9 m
High Body Mass Index	10.2 m
Low physical activity	5.6 m
High fasting blood glucose	4.9 m
Alcohol use	4.6 m
High blood cholesterol	4.0 m
Air pollution	2.5 m
Workplace hazards	2.4 m

[a] Disability-Adjusted Life Years = the years of life lost to disease and early death, annually, in the population.

Source: IHME 2014.

Table 2

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report in 2004 estimated the health service costs of treating obesity itself to be some £50m but the costs of managing the chronic disease consequences to be around £1bn.[12] In 2014 the UK government stated that costs to the NHS in England alone exceeded £5bn,[13] some 5% of the total NHS budget. Estimates in other European countries and North America suggest obesity-related ill-health is absorbing between 6% and 10% of total health service budgets, with the US healthcare costs exceeding $147bn in 2008 prices.[14] These figures are based on the proportion of costs of diseases which can be attributed to obesity, but data are available for very few of these (usually only diabetes mellitus, heart disease, colon cancer and gallstones). Costs attributable to excess weight among overweight but non-obese patients are rarely included in such analyses, and even though the cost may be less per patient, the numbers of overweight, non-obese adults are likely to be greater.

Individual costs

Individuals also bear costs as a result of their own obesity. Food costs are likely to be greater, clothing may need replacing, furniture may need strengthening, and additional support services (taxis, cleaning, hygiene, etc.) may need to be purchased. Health insurance premiums may be set at a higher level for obese people. There are also psychological costs: an obese person may experience a reduced quality of life, for example, through reduced ability to travel, reduced social networking and reduced self-esteem. Studies show that overweight young women tend to have a more limited friendship circle, fewer years of school education, a lower likelihood of marriage, reduced employment prospects and reduced household income.[15] These stressors may exacerbate weight gain and reduce the motivation for change.

Indirect costs

Besides the direct costs in healthcare, further costs arise from obesity-related ill-health leading to absence from work, lost productivity, disability support, early pension payments and increased demand on community resources. These additional costs are as high, or higher, than the direct healthcare costs, and are forecast to rise significantly.[16]

The impact of obesity in the community is harder to calculate but can have a significant cost implication. For example, airlines in the USA spend more than $275m annually in extra fuel as a result of the rise in average body weight among American adults.[17] Burning this extra fuel releases nearly 4 million tonnes of CO_2 emissions along with other pollutants. Similar calculations can be assumed for Europe and, increasingly, other regions of the world. ◆

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Clinical Review

Clinical Review identifies issues in the medical literature of interest to clinicians in Africa. Essential references are given at the end of each section

Pharmacy Review

Ebola

I have recently returned from Sierra Leone after helping with an Ebola clinical trial with a team from Oxford University, funded by the Wellcome Trust. The clinical trial results are not yet available, and I am not going to pre-empt the results.

The journal *PharmaTimes* has published a series of articles on Ebola in their March edition.[1] The articles estimate the cost of the epidemic as more than £30 billion (US$40 billion), which includes loss of earnings and costs to the economy of West Africa, not just Sierra Leone, Guinea, and Liberia.

The simplest way to reduce mortality is with early rehydration and electrolyte replacement. The article lists some of the vaccines and drug treatments either currently being studied, or in the pipeline, 3 vaccines, 3 drug treatments, and antibodies from survivors.

An article in the online journal *mBio*, published by *the American Society of Microbiology*[2] looks at known and supposed methods of transmission of Ebola. Surfaces in Ebola treatment centres, including the outside of workers' masks, have been shown to contain virus material, but there is no evidence of infection from visibly clean surfaces. There have been very few cases from contact with asymptomatic patients in the early stage of the disease.

The vast majority of cases concern contact symptomatic Ebola patients. As patients become more ill with Ebola, the number of virus particles shed increases. After death there is a high risk of infection. In one incident, 300 positive cases were the result of 1 unsafe burial.

Ebola is highly infectious and exposure to as few as 10 virus particles can cause infection. It is possible that infection occurs through the inhalation of virus particles from body fluids. Infection in animals has been proven to occur through inhalation, but this has not been established in humans.

Full personal protective equipment (PPE) prevents infection, provided that doffing (undressing and removal) is done in a controlled manner preventing contact with the outside of the PPE.

There have been two health workers infected in the USA who came into contact with an Ebola patient, but the mode of transmission is unknown, as they were wearing PPE.

As I write the latest news is that after a drop in cases, the numbers have once again gone up, but nowhere near the levels seen earlier in the epidemic.

A World Health Organization (WHO) press release (widely reported in the media) said that vaccine trials will not produce any useful data as the number of cases is falling. The WHO also reported that 'two drugs Zmapp made by Zmapp Pharmaceuticals and sIRNA by Tekmira Pharmaceuticals are also being tested and it is hoped that they will produce some limited results on efficacy'.

We all hope that the current epidemic will resolve, and that international resources will be more rapidly made available in future outbreaks. To prevent the high numbers of deaths seen in the current outbreak. The Ebola Virus in the current West Africa outbreak is a different strain from previous outbreaks, which may explain the much higher number of cases. Poor living conditions and poverty are also factors.

I was told in Sierra Leone that the rapid diagnosis kits used were useless as they gave a significant number of false-positive and false-negative results, so it was never sure from the results if a patient had Ebola or not. The tests were abandoned in favour of the more lengthy viral Polymerase Chain Reaction (PCR) tests.

Too much medicine

The *British Medical Journal* has published a series of articles, 'Too Much Medicine' about the dangers of over treatment. This is nothing new as the WHO Model Formulary (which has not been revised since 2008) has in its introduction some guidelines about treating patients:
General advice to prescribers:
Rational approach to therapeutics:
Drugs should only be prescribed when they are necessary, and in all cases the benefit of administering the medicine should be considered in relation to the risks involved. Bad prescribing habits lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher cost.

1. Define the patient's problem;
2. Specify the therapeutic objective;
3. Select the therapeutic strategies:
   a. Non-pharmacological treatment;
   b. Pharmacological treatment;
3. Selecting the correct group of drugs;
4. Selecting the drug from the chosen group (to suit an individual patient);
5. Giving information, instructions, and warnings;
6. Monitoring treatment.

If a decision has not been made about the treatment outcome, it needs to be considered whether or not the patient needs the treatment. Monitoring treatment is important because it may indicate that the treatment isn't working, or if the patient suffers from adverse effects and stops long-term treatment.

The edition published on 4th March 2015 has 'Too Much Medicine'[3] as its theme and the phrase can be used to describe a variety of problems including: overdiagnosis; overtreatment; and turning an ordinary event into a medical diagnosis ('medicalisation'), for example old age.

An article in the same edition[4] looked at overprescribing of antimalarials in Ghana. Rapid diagnostic tests were used in drug stores (called chemical shops in Ghana). After proper training, especially to prevent the spread of Hepatitis B, the tests were used. The outcome

was that fewer antimalarials were used, but that the patients proven to have malaria were still receiving adequate treatment.

In the study, three quarters of the patients presenting with fever tested negative for malaria and required only simple analgesia. Correct rapid diagnosis is appropriate for many conditions.

New medicines, better medicines, better use of medicines

In May 2014, the Royal Pharmaceutical Society of Great Britain published a report 'new medicines, better medicines, better use of medicines'.[5]

The first part of the report covers the history of medicine development, antibiotic development, neglected diseases (some are tropical diseases, others rare genetic disorders), new uses for old drugs, selecting appropriate medicines for individual patients.

The second part of the report looks at the better use of medicines. Using medicines only when appropriate, improving patients' awareness of their medical condition to improve compliance with treatment.

The wide-ranging report deals also with medication errors including better prescribing, ensuring the correct medicines are dispensed, and getting an accurate drug history of the patient. Accurate drug histories are important to make sure vital medicines are not omitted, and to prevent drug interactions.

The correct use of antibiotics is mentioned, using them only when necessary. The development of new antibiotics presents a problem. There have been no new classes of antibiotics since 1987, and it would be difficult for the pharmaceutical industry to make a profit on development costs if new antibiotics are kept in reserve and very rarely used as a last resort.

One specific problem of prescribing antibiotics is mentioned that, in developed countries, children are significantly heavier at a given age, and the recommended doses for a given age group may not be sufficient to treat them. To reduce the risks of the infection and of antibiotic resistance the weight of children should be taken into account. In addition for obese patients, the doses required need to be adjusted as many drugs are not distributed into fat, and if a dose is based only on weight, patients will be over-dosed.

The 120-page report is worth looking at; the important points are in highlighted boxes, making reading it easier.

New guide to medicines and drugs

A few years ago I reviewed the British Medical Association publication, 'A New Guide to Medicines and Drugs', a new edition has been published at the beginning of this year,[6] it has been updated and includes new classes of medicines, for example monoclonal antibodies (the 'mab's'). It is still one of the best reference books available on the UK market, and relatively inexpensive at £18.99.

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Public Health Review

Impact of Ebola on public health programmes

Normally our public health reviews scan recent literature to highlight a current public health issue. Since the Ebola outbreak of 2013-2015 in West Africa is such a recent event itself, much of the available information on its impact must also be gleaned from the press and agency reports. Hopefully a more permanent documentation of the lessons from Ebola can occur as time gives a longer perspective on our public health systems.

First we will briefly set the stage and show how Ebola Virus Diseases (EVD) disrupted the public health system by damaging the already weak human, material and infrastructural resources of the health system. Then we briefly examine effects on specific public health programmes including immunisation, antenatal care, malaria prevention and food/nutrition.

Overview of the Ebola effect on health systems

As of mid-April 2015, the World Health Organization (WHO) reported that 861 health workers had contracted EVD and 499 had died.[1] Using data on WHO country profile websites[2] and Ebola statistical updates[3] as of April 2015, doctors, nurses and midwives were only 0.02% of the population of the three countries, but accounted for 3% of Ebola cases and 5% of Ebola deaths.

Not only did the loss of health workers make it difficult or impossible to run a health clinic, the fact that those entrusted with community health were dying created fear. 'Lack of trust in government-supported services after the death of a healthcare worker with symptoms of Ebola resulted in ongoing Ebola transmission in two Liberia counties. Ebola transmission was facilitated by attempts to avoid cremation of the deceased patient, and delays in identifying and monitoring contacts.'[4]

The reason health workers were dying in such relatively large numbers could be traced to the inadequacies in basic equipment, supplies and adherence to procedures to prevent infection in the workplace.[5] Infection prevention and control (IPC) has received much attention in terms of preventing the spread of EVD, but if such measures had been in place prior to the Ebola outbreak to enable safe handling of blood and other samples, and safe disposal of human and hospital wastes, EVD would not have gotten a foothold within the health services.

WHO did update its infection prevention guidelines with special reference to hemorrhagic fevers in December 2014.[6] Efforts to promote IPC in all healthcare procedures has long predated the current EVD outbreak.

For example, for more than a decade, Jhpiego has been an international leader in advocating for and implementing evidence-based standards for infection prevention (IP) practices that protect both client and healthcare worker.[7]

Immunisation programmes

When clinics close or are understaffed, child health programmes like immunisation halt. The fact that needles are involved increases the risks that such efforts could spread EVD if not done with care.

Saki Takahashi and colleagues undertook a projection in late 2014 of what the disruption in health services would mean for the spread of measles. They estimated that after 6-18 months of health service disruption, the pool of unvaccinated and susceptible children could increase to over 200 000 resulting in 2000 to 16 000 additional deaths.[8]

Unfortunately, the response needed to be guarded. WHO recommends that countries for the moment avoid mass gatherings. Vaccination campaigns are advised to be postponed until the country has been declared Ebola free after 42 days without detection of any new cases.[9]

The reality was not as dire, but disturbing none-the-less. 'This January a measles outbreak erupted. So far this year, there have been 562 cases; seven were fatal.' In addition, more than 500 children came down with whooping cough. This led Liberia to launch a nationwide measles vaccination campaign in May, wherein health officials hoped to reach almost 700 000 children in a country of 4 million people.[10]

Antenatal care

Several Non-Government Organisations in Sierra Leone reported on the views of children on the effects of the EVD epidemic in their communities. A common perspective was that, 'all health resources were focused on Ebola, neglecting other conditions'. Because of this, the report also explained, 'Pregnant women and new mothers lost out on access to the pre- and post-natal care that is required to reduce maternal mortality rates'.[11]

In Liberia, Lyengar and colleagues studied maternal and child health service utilisation in two counties during the EVD outbreak. They found that Bong and Margibi Counties in Liberia experienced a large drop in utilisation of maternal healthcare services during what now appears to be the peak of the Ebola outbreak. 'In Bong County, totals were less than 14% of the peak numbers during the outbreak for number of antenatal visits and pregnant women receiving intermittent preventive treatment for malaria in pregnancy (IPTp).'[12]

Bednets for malaria

Models have shown that an additional 3.5 million malaria cases may have resulted from the inability of the health services during the Ebola outbreak to provide prevention and treatment services.[13] Regular net distribution is crucial 'because nets degrade over time as a result of wear and tear and waning insecticide concentration'.

Although malaria mortality has been reducing generally in Africa, in part through distribution of free insecticide-treated bed nets (ITNs), 'the Ebola outbreak has brought those efforts to a standstill in the three affected countries'.[14] Liberia had planned a national campaign to distribute ITNs in 2014, but that was postponed.

It had been hoped that in preventing malaria, people would be less likely to have fevers that were not Ebola and therefore less likely to come in contact with real Ebola patients in Ebola treatment units. World Malaria Day 2015 (25th April) was used to launch of the distribution of 2.8 million mosquito nets in Liberia.[15] This began with two-day training sessions for general community health volunteers who would help distribute the nets and reinforce their use.[16]

Nutrition and food security

'The world's worst Ebola epidemic has endangered harvests and sent food prices soaring in West Africa', according to the United Nations Food and Agriculture Organisation (FAO).[17] The situation was made worse by restrictions on people's movements and the establishment of quarantine zones. Not only were farmers affected by EVD, but many workplaces closed either due to fear or loss of staff, such that food was no longer affordable or accessible.

Using Liberia as an example, the World Food Programme reported that restricted movement and border closures constrained food transporters/traders from moving food within Liberia. Areas with high incidences of EVD are among the most productive agriculture regions (Central and Northwest).[18]

The overall effect of these market challenges is that people began reducing the number of meals they ate each day. Even when food is available, prices increase, especially for imported supplies that were to replace lost production on the local farms. Overall the situation was 'compounded by the fact that household incomes and savings are decreasing, as people are either unable or too afraid to work. And as more and more people contract the virus or die from it, families are also losing key sources of revenue'.[19]

In conclusion, Ebola caused major disruptions of already weak health systems such that basic preventive and public health services were severely curtailed or halted. This led to what could be termed collateral deaths by people who caught malaria since they did not have an ITN, who could not protect their pregnancies through regular antenatal care, who could not get enough to eat and stave off nutrition-related illnesses, and who could not receive life-saving vaccinations. The next disaster might be a disease like Middle East Respiratory Syndrome, or an earthquake or typhoon. It could even be man-made civil wars. The key lesson from Ebola is that contingency planning needs to be in place to ensure that basic public health services can continue.

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Dermatology Review

Kaposi's sarcoma is a significant problem even in the era of highly active antiretroviral therapy

Kaposi's sarcoma (KS) was the first tumor to be described in association with HIV infection and is an AIDS-defining condition. It remains a significant problem in sub-Saharan Africa even in the era of highly active antiretroviral therapy (HAART), and recent published studies on HIV-related KS come mainly from observations of KS in African populations. This article gives an overview of the current status of HIV-KS in Africa.

KS is a malignancy of the lymphatic endothelium resulting in angioproliferative lesions, which most commonly involve the skin. There are 4 clinical variants of KS: 'classical KS' which was first described in 1872 in Europe; 'endemic KS' which was described in the 1950s in young predominantly male individuals mainly in sub-Saharan Africa; 'iatrogenic KS' as a consequence of long-term immunosuppressant medication; and 'epidemic KS' which is associated with AIDs and was first described in 1981. All epidemiological types of KS are associated with Human Herpes Virus type 8 (HHV-8), which is also know as KS-associated herpes virus (KSHV). Histologically and clinically these variants are similar but their clinical course and prognosis vary. African endemic KS is generally an indolent disease in the majority of cases. In contrast HIV-KS can be an aggressive disease with advancing HIV immunosuppression and is associated with significant morbidity and mortality.[1] Prior to 1981, African endemic KS comprised less than 10% of all malignancies in sub-Saharan Africa (in 1971 it comprised 9% of all cancers seen in Uganda). Now KS, largely as a consequence of the HIV pandemic, is one of the most common malignancies in sub-Saharan Africa and the most common malignancy in HIV-infected individuals with a recorded prevalence of more than 50% of all cancers in some regions of Africa.[2] The pathogenesis of HIV-KS is multifactorial and involves an interaction of HIV immunosuppression, HHV-8 co-infection, HIV-1 replication induced pro-angiogenic transactivating (*tat*) protein, and inflammatory cytokines. Histologically, KS lesions are characterised by proliferating spindle cells, angiogenesis, erythrocyte-replete vascular slits, oedema, and a variable inflammatory cell infiltrate. Prior to the availability of HAART in sub-Saharan Africa, HIV-KS mortality was high with a 12 month overall survival of only 30-40%. Since the introduction of HAART there has been a general decline in the incidence of HIV immunosuppression-related KS and a significant improvement in survival of patients with established HIV-KS. However, immune reconstitution inflammatory syndrome (IRIS)-associated KS is now a well-recognised potential complication following ART initiation.[2-5]

Clinical features of HIV-KS

In HIV seropositive individuals cutaneous KS is the most common clinical presentation in adults, whereas children more commonly present with enlarged lymph nodes. Skin lesions often begin as violaceous macules before progressing to papules, plaques, nodules and even tumorous lesions. Cutaneous lesions have also been described as 'fungating', 'vegetative' and 'verrucous'. Skin lesions can occur at all sites on the body



Figure 1: Widespread cutaneous HIV-KS



Figure 2: Patient in figure 1 with oral mucosal KS

and are usually symmetrical (Figure 1). Cutaneous disease is usually asymptomatic but can be disfiguring and stigmatising. Ulceration, bleeding, and secondary bacterial infection can complicate large cutaneous KS lesions. KS is commonly associated with non-pitting oedema, which signifies lymphoedema and this most commonly involves the face, genitals and limbs. KS lymphoedema can become painful and cause functional impairment. Cutaneous KS is not life-threatening but visceral KS can lead to severe complications associated with bleeding and obstruction. The lymph nodes are the most commonly involved extra-cutaneous site followed by the gastrointestinal tract. Oral mucosal involvement, particularly of the hard palate, gingivae and tongue, is seen in approximately 20% of HIV-KS cases (Figure 2). Oral KS is often a useful indicator of visceral involvement and is believed to be associated with a worse prognosis. Pulmonary KS, although less common, is associated with the worst prognosis and requires urgent management. It is associated with symptoms of cough, dyspnea, and haemoptysis. Systemic gastrointestinal and pulmonary KS may occur in the absence of skin lesions.



Figure 3: IRIS-KS manifesting with rapid expansion of existing lesions and development of new lesions associated with significant oedema

IRIS-associated KS

Improved access to ART has dramatically reduced HIV-associated mortality and commencement of antiretroviral therapy (ART) earlier in the course of advancing HIV immunosuppression significantly improves outcomes. However, ART-associated immune reconstitution has been associated with a paradoxical worsening of some diseases or development of new disease, a phenomenon known as IRIS. The risk of IRIS is highest amongst individuals who have been diagnosed with HIV late in the course of HIV immunosuppression and therefore have been commenced on ART with a low baseline CD4 count. This clinical scenario is not uncommon in sub-Saharan Africa and therefore IRIS-related diseases, in particular opportunistic infections, have been a significant problem. This includes IRIS-associated cryptococcosis and tuberculosis, which are associated with considerable morbidity. In sub-Saharan Africa IRIS-associated KS is now also a well-recognised complication. Unmasking IRIS-KS (the development of KS *de novo* with successful immune reconstitution following ART initiation) and paradoxical IRIS-KS (a paradoxical worsening of existing KS despite successful immune reconstitution following ART initiation) has a prevalence of 7%-31%.[4] This wide variation in prevalence is probably a consequence of differences in initial severity of KS, the stage at HIV immunosuppression when ART is commenced, and differences in ART regimens and protocols in different settings. IRIS-KS can develop quickly and be severe. Onset is between 1-22 weeks, but usually occurs within the first 3 months after ART initiation[4,5] as is the case with most IRIS-associated diseases. It is associated with a rapidly declining HIV viral load and improving CD4 counts. IRIS-KS often presents with inflammation and enlargement of existing cutaneous KS lesions and/or worsening of KS-associated oedema (Figure 3). Existing lesions may also extend and new lesions may appear at different anatomical sites. The increasing size or extension of cutaneous KS lesions can be dramatic and alarming. The significant oedema associated with IRIS-KS can cause discomfort. Severe facial and periorbital odema associated with KS has been reported to be so severe as to prevent patients from opening their eyes. IRIS-KS is associated with a high-risk of gastrointestinal and pulmonary involvement, and serious and life-threatening complications of IRIS-KS include gastrointestinal bleeding and acute airway obstruction. A worsening of pulmonary KS as a consequence of IRIS in particular requires vigilant and close monitoring.[5] Patients should be counseled and supported to continue with ART despite any sudden deterioration of visible cutaneous KS following ART initiation. It is also important to differentiate IRIS-KS from worsening KS as a consequence of ART failure.

Diagnosis

KS in HIV-infected individuals is an AIDs-defining diagnosis irrespective of the CD4 count. Although the risk of KS is higher with advancing HIV immunosuppression, it can occur also at relatively high CD4 counts before ART initiation. The cutaneous lesions of KS are often easily recognisable and pathognomonic. However, there is a wide differential diagnosis of cutaneous angiomatous lesions and diseases such as bacillary angiomatosis, lymphoma, haemangiomas, sarcoidosis, vasculitis and others have been misdiagnosed as KS. Therefore, if possible, a biopsy is recommended to confirm the diagnosis of KS. In resource-limited settings stools are usually evaluated for occult blood to screen for GI involvement. Endoscopy establishes the diagnosis. Similarly a chest X-ray may identify pulmonary involvement but a definitive diagnosis requires a bronchoscopy.

The most widely accepted staging system for HIV-KS in adults is the AIDS Clinical Trials Group (ACTG) criteria which classifies disease according to three criteria: tumour extent, immune status, and associated systemic illness, each of which is subdivided into good and poor prognostic indicators.[6]

Treatment

Despite the potential risk of IRIS-KS, ART had been shown to decrease the incidence of new KS among HIV-infected individuals and is also associated with the resolution of KS lesions. ART-associated regression of KS is believed to be related to a number of factors: a reduction in HIV viral load and therefore tat-induced angioproliferation, improved immune responses to HHV-8, and the direct anti-angiogenic effect of some protease inhibitors. Therefore, HIV-KS is managed by ART initiation if patients are ART naïve with the aim of reversing HIV immunosuppression. ART alone is usually adequate for KS localised to the skin and mucous membranes. Systemic cytotoxic chemotherapy is necessary for advanced disease at risk of complications. This includes symptomatic visceral disease, IRIS-KS, and extensive lymphedema. Radiotherapy may be required in cases of airways obstruction and is also very effective for large, troublesome cutaneous lesions and localised painful lymphoedema. Radiotherapy is also given to palliate patients with very low CD4 counts who require systemic chemotherapy, but will not tolerate the side effects. In some centres chemotherapy is deferred in patients with low CD4 counts until their CD4 count improves with ART.[3]

A recent Cochrane Review assessed the effectiveness of current therapeutic regimens for severe or progressive HIV-KS. They identified six randomised controlled trials and three observational studies that assessed the efficacy of HAART monotherapy and combinations of HAART and chemotherapy. Seven of the nine studies included patients with mild to moderate (T0) KS as well as severe (T1) KS, and therefore data could only be extracted from 792 adults with severe HIV-KS. The review's findings concluded that HAART in combination with chemotherapy demonstrates greater efficacy in reducing disease progression compared to HAART alone in patients with severe or progressive KS. They observed no difference between the efficacy of liposomal doxorubicin, liposomal daunorubicin and paclitaxel in patients on HAART.[7] However, these chemotherapy regimens are not widely available in resource-limited regions and there are limited studies evaluating HAART chemotherapy regimens for HIV-KS in Africa where first-line therapy often still consists of combinations of vincristine, doxorubicin, and bleomycin (ABV). Oral etoposide is also used when intravenous drug therapy is not available or possible because of limitations of resource. The first randomised controlled trial of HAART versus HAART and chemotherapy for HIV-KS in Africa was only recently published in 2012 and demonstrated higher overall KS response over 12 months for HAART/chemotherapy combination therapy.[3]

Corticosteroids have no role in the management of KS. Corticosteroids have been associated with the development of new KS or progression of existing KS, possibly as a consequence of its effect on HHV-8 viral replication. Corticosteroids use in HIV-infected patients with KS should be avoided except in circumstances when it is absolutely necessary for the treatment of other diseases. In such instances patients require careful monitoring for any worsening of any visceral KS.

In the case of IRIS-KS, ART should be continued. Chemotherapy is indicated and is effective in suppressing IRIS-associated flare. It is possible that chemotherapy for extensive KS prior to ART initiation may help to prevent IRIS-KS, but this has not been systematically investigated. Close clinical monitoring is recommended in seropositive patients with existing KS when initiating, changing or resuming ART because of the risk of paradoxical IRIS.

In conclusion, sub-Saharan Africa still has the highest burden of HIV-KS globally. This has been attributed to a number of factors: the high seroprevalence of HHV-8, advanced HIV immunosuppression before ART initiation, and the risk of IRIS-KS. The clinical course of HIV-KS is unpredictable: it can produce mild and limited disease or severe and progressive disease. Furthermore, ART can lead to regression of KS or a paradoxical worsening. Following the diagnosis of cutaneous HIV-KS, patients should be carefully assessed for possible visceral involvement and monitored for disease progression after ART initiation.

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(See page 40)

Part one

Part two

Part three/ four

Q1 (a), (b), (c), (d). Of course infection must be included as a cause, but bilious vomiting in an infant is a sign of obstruction until proven otherwise. Volvulus, like intussusception (the commonest cause of obstruction at this age) does not necessarily lead to obvious distress, and cannot be ruled out.

Q2 (a), (b), (c), (d), (e) and (f). All are essential, with the proviso that none of the tests should delay the surgical opinion. The pH measurement is important in differentiating between sepsis (which causes acidosis) and pyloric stenosis (which leads to alkalosis). Abdominal ultrasound is preferred to X-ray studies with or without contrast media for the diagnosis of intussusception.

Q3 (a), (b), (c), (d) and (e). Fluid balance must be maintained with great care to avoid over- and under- hydration. Antibiotics will be the choice of the usual hospital antibiotic regimen committee's decision. If intussusception is the diagnosis, the standard way to reduce it is by air enema: laparotomy however, may be the only answer.

Q4 (f). The risk is very small, but live rotavirus immunisation has been linked with one case of intussusception in around 60 000 vaccinated infants. It is such a tiny extra number of cases that it verges on the insignificant, but it is wise to remember this when facing a child with bilious vomiting in the week after live rotavirus immunisation.

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Save the Children	13	www.elrha.org/r2hc/home
Siemens	IFC & 6	www.healthcare.siemens.com

Pharmacology

Prescription opioids and neonatal abstinence syndrome

Neonatal abstinence syndrome (NAS) is a serious medical condition of the new-born occurring after in utero exposure to psychotropic medications. As yet, no figures exist to establish the risk of NAS among infants born to mothers using prescription opioid analgesia during pregnancy.

A recent population study gathered data from pregnant women across the USA who were using prescription opioid analgesia. The authors aimed to provide the risk estimates of NAS based on the duration and timing of opioid use.

In the cohort of 290 000 women, a total of 1705 cases of NAS were identified. This corresponded to an absolute risk of NAS of 5.9 per 1000 deliveries. Additional factors that increased the risk of NAS included long-term opioid use during pregnancy, alcohol or other drug misuse, and exposure to other psychotropic medications.

The use of prescription opioids during pregnancy is associated with a low absolute risk of NAS in the absence of additional risk factors.

Desai R, Huybrechts K, Hernandez-Diaz S, et al. Exposure to prescription opioid analgesics in utero and risk of neonatal abstinence syndrome: population based cohort study. *BMJ* 2015; 350: 2102.

The risk of lung disease with methotrexate

Methotrexate is frequently used for the treatment of many non-malignant inflammatory diseases. However, methotrexate has been implicated as a cause of serious lung disease.

Therefore, a recent study performed a meta-analysis to quantify the relative risk of pulmonary disease among patients with rheumatoid and psoriatic arthritis, psoriasis, and inflammatory bowel disease. A total of seven randomised trials were analysed to investigate respiratory adverse events of methotrexate compared with placebo or active comparator drug.

Together the studies comprised 1640 patients, reporting 946 patient-years of exposure. In total, 504 respiratory adverse events were documented among participants. Methotrexate was not associated with an increased risk of adverse events, respiratory infections, or non-infectious respiratory events. No pulmonary deaths were observed.

Patients with non-malignant inflammatory conditions treated with methotrexate had no increase of lung disease.

Conway R, Low C, Coughlan R, et al. Methotrexate use and risk of lung disease in psoriasis, psoriatic arthritis, and inflammatory bowel disease: systematic literature review and meta-analysis of randomised controlled trials. *BMJ* 2015; 350: 1269.

Antipsychotic drug use in pregnancy

There has been a considerable rise in antipsychotic medication use in pregnancy over the past decade. Despite this dramatic rise, little is known about their use during pregnancy.

A population study aimed to evaluate maternal medical and perinatal outcomes associated with antipsychotic drug use in pregnancy. All 1021 participants had at least two consecutive prescriptions for an antipsychotic during pregnancy (specifically during the first or second trimester). Participants were matched 1:1 with non-user controls.

Data concerning the maternal medical outcomes demonstrated that antipsychotic drug use did not increase the risk of gestational diabetes, hypertensive disorders of pregnancy, or venous thrombo-embolism. The preterm birth rate was not increased among the antipsychotic group, and neither were the rates of low or high birthweight.

Antipsychotic drug use in pregnancy had minimal impact on important maternal medical and short-term perinatal outcomes.

Vigod S, Gomes T, Wilton A, et al. Antipsychotic drug use in pregnancy: high dimensional, propensity matched, population based cohort study. *BMJ* 2015; 350: 2298.

Global Health

Global access to surgical care

Previous estimates suggest that 2 billion people are unable to access surgical care. However, this estimate does not take into account capacity, safety, timeliness, accessibility, and affordability. Therefore, a commission aimed to re-estimate this figure by taking into account the aforementioned factors.

Using modelling data from 196 countries, the authors were able to estimate the proportion of the population in each country without access to surgical services.

At least 4.8 billion people do not have access to surgery. The proportion of the population without access varied widely by region. Over 95% of the population in south Asia, and much of sub-Saharan Africa, does not have access to care compared with 5% of the population in Australasia, North America and Western Europe.

Most of the world's population does not have access to surgical care. The near absence of access in many countries represents a crisis.

Alkire B, Raykar N, Shrime M, et al. Global access to surgical care: a modelling study. *Lancet Global Health* 2015; 3: 316–23.

Mass treatment for yaws

Yaws is a neglected tropical disease caused by Treponema pallidum. It causes primary and secondary cutaneous lesions and tertiary destructive lesions of the bone. The World Health Organization (WHO) has launched a new initiative to eradicate yaws by 2020. The proposed intervention involves mass treatment of the entire population with a single dose of oral azithromycin.

A recent study conducted on a Papua New Guinea island assessed the efficacy of this intervention. A total of 82.7% of the residents (n=13 302) received a single dose of azithromycin. The prevalence of active infectious yaws was significantly reduced from 2.4% to 0.3% one year after mass treatment. The prevalence of latent yaws among children aged 1–5 years was also significantly reduced from 18.3% to 6.5%. A total of 17% of participants reported mild medication side effects. No resistance to macrolides against Treponema pallidum was detected.

The prevalence of active and latent yaws infection fell substantially after mass treatment with azithromycin.

Mitjà O, Houinei W, Moses P, et al. Mass treatment with single-dose azithromycin for yaws. *NEJM* 2015; 372: 703–10.

Global epidemiology of yaws

Currently the knowledge regarding the geographic extent of yaws infections is incomplete. In order for the World Health Organization (WHO) strategy of yaws eradication to be successful, the scope of yaws infection needs to be determined. Therefore, a systemic review has been conducted to determine yaws epidemiology and to estimate at-risk populations in endemic countries.

Using databases, the authors identified studies that estimated the prevalence of yaws. The active disease estimates from the studies ranged from 0.31% to 14.5% in yaw-endemic areas, while the latent disease prevalence ranged from 2.4% to 31%. Of the 250 000 new cases reported to WHO during 2012–2013, 84% were from Papua New Guinea, Solomon Islands,

and Ghana. In Africa, 46.7 million people live in endemic areas, the majority of which reside in Ghana, Côte d'Ivoire, Cameroon, and the Republic of Congo.

Papua New Guinea, Solomon Islands, and Ghana should be the initial focus of efforts at implementing the WHO yaws eradication programme.

Mitjà O, Marks M, Konan D, et al. Global epidemiology of yaws: a systematic review. *Lancet Global Health* 2015; 3: 324–31.

Consequences of tobacco taxation

In 2010, tobacco use was estimated to be responsible for 5 million premature deaths. Tobacco taxation is extremely effective at reducing smoking and its negative impacts, while increasing government revenue. However, it has been criticised for disproportionately affecting poorer people.

In China, there are over 300 million male smokers. To assess the impacts of tobacco taxation on household health and finances, a cost-effective analysis was conducted across China.

Modelling analysis showed that a 50% increase in tobacco price through excise tax would lead to 231 million years of life gained over 50 years (a third of which would be gained by the poorest 20% of households). It would also increase tax revenues by US $703 billion (the lowest income quintile would contribute 14%). Overall house expenditure on tobacco would fall by $21 billion in the poorest 20% of households but increase tobacco expenditure in the remaining 80%.

Increased tobacco taxation can be a pro-poor policy whilst simultaneously providing substantial health and financial benefits.

Verguet S, Gauvreau C, Mishra S, et al. The consequences of tobacco tax on household health and finances in rich and poor smokers in China: an extended cost-effectiveness analysis. *Lancet Global Health* 2015; 3: 206–16.

Orthopaedics

Lumbar spine stenosis surgery: laminectomy vs microdecompression

Stenosis of the lumbar spine is characterised by back and leg pain numbness, and can also impair walking. Surgery is a successful form of management and can be performed using one of two different techniques. Traditionally, open laminectomy was the most common operation performed for the condition but recently a shift towards minimally invasive surgical methods (such as microdecompression) has occurred.

To compare efficacy, a Norwegian observational study enrolled 855 patients undergoing either laminectomy or microdecompression surgery for lumbar spine stenosis. The outcomes compared included pain, ability to perform daily tasks, walking, sleepy quality, and sexual function one year after surgery.

A total of 721 patients completed one year of follow-up. Favourable outcomes were observed at one year in both groups. However, results indicated that at one year, the effectiveness of microdecompression is equivalent to laminectomy in the treatment of stenosis of the lumbar spine. No difference was noted between the groups for the quality of life.

Both surgical methods are equally effective at one year.

Nerland U, Jakola A, Solheim O, et al. Minimally invasive decompression versus open laminectomy for central stenosis of the lumbar spine: pragmatic comparative effectiveness study. *BMJ* 2015; 350: 1603.

Lumbosacral pain: steroid injections compared with gabapentin

The physical, socioeconomic, and psychological impact of low back pain is enormous. Epidural steroid injections are the most commonly performed procedure for the management of radicular pain. Nevertheless, research also indicates pharmacotherapy with gabapentinoids can be effective; however, little is known about their comparative efficacy.

A recent study compared the outcomes for both treatments among 145 participants with lumbosacral radicular pain. Each participant was given either epidural steroid injection plus placebo pills or sham injection plus gabapentin. The primary outcome measured average leg pain at one month.

Results showed a reduction in pain in both groups but there were no significant differences observed between the groups. However, those participants receiving steroid injections were temporarily more likely to experience a successful outcome than those receiving gabapentin.

Both steroid injections and gabapentin produced a modest reduction in pain. Any differences favouring steroid injections were modest and transient.

Cohen S, Hanling S, Bicket M, et al. Epidural steroid injections compared with gabapentin for lumbosacral radicular pain: multicenter randomized double blind comparative efficacy study. *BMJ* 2015; 350: 1748.

Cardiovascular

Diagnosing acute heart failure with natriuretic peptides

Making the correct diagnosis of acute heart failure in patients is challenging. Low levels of three types of natriuretic peptides (B type, NTproBNP, and MRproANP) can help exclude a diagnosis of chronic heart failure but levels of natriuretic peptides are only sporadically used for diagnosing acute heart failure.

Recently a meta-analysis compared the diagnostic accuracy of the three types of serum natriuretic peptides in patients presenting with acute heart failure.

At the lower recommended thresholds of 100 ng/L for B type NP and 300 ng/L for NTproBNP, the peptides had sensitivities of 0.95 and 0.99 and negative predictive values of 0.94 and 0.98 respectively. Using the recommended lower threshold of 120 pmol/L, MRproANP had a sensitivity in the range of 0.95-0.97 and a negative predictive value ranging from 0.90 to 0.97. Higher thresholds for the peptides resulted in declining sensitivity but the specificity remained variable.

B type, NTproBNP, and MRproANP natriuretic peptides have excellent ability to exclude heart failure.

Roberts E, Ludman A, Dworzynski K, et al. The diagnostic accuracy of the natriuretic peptides in heart failure: systematic review and diagnostic meta-analysis in the acute care setting. *BMJ* 2015; 350: 910.

Arteriovenous anastomosis for uncontrolled hypertension

Less than half of patients treated for hypertension achieve blood pressure control and most of these do not maintain long-term adherence. The creation of a central arteriovenous anastomosis results in an alteration of the mechanical properties of arteries that are, in turn, thought to reduce blood pressure.

To assess the efficacy of this intervention, a trial tested the impact of creating an iliac arteriovenous anastomosis (via catheterisation and a ROX coupler device) on systolic blood pressure in patients with uncontrolled hypertension.

A total of 195 patients were randomised to undergo implantation of an arteriovenous coupler device plus standard hypertensive treatment, or standard treatment alone. After 6 months, ambulatory blood pressure had reduced by 13.5 mmHg in the anastomosis group, compared with 0.5 mmHg in the control

group. Late venous stasis occurred in 29% of patients in the anastomosis group.

Arteriovenous anastomosis was associated with significantly reduced blood pressure and hypertensive complications.
Lobo M, Sobotka P, Stanton A, et al. Central arteriovenous anastomosis for the treatment of patients with uncontrolled hypertension (the ROX CONTROL HTN study): a randomised controlled trial. *Lancet* 2015; 385: 1634–41.

Primary PCI with or without thrombectomy

Primary cutaneous intervention (PCI) is the most effective method of achieving reperfusion in patients with ST-elevation myocardial infarctions (STEMI) but can fail to restore microvascular flow due to distal embolisation. It has been postulated that thrombectomy before stent deployment may increase microvascular flow.

A recent trial with a cohort of 10 732 patients diagnosed with STEMI were randomly assigned to undergo either PCI plus manual thrombectomy or PCI alone. The primary outcome measured death from cardiovascular causes, recurrent myocardial infection, cardiogenic shock or severe heart failure within 180 days.

The primary outcome occurred in 347 of 5033 patients (6.9%) in the thrombectomy group versus 351 (7.0%) in the PCI-alone group (insignificant hazard ratio, 0.99). Stroke within 30 days occurred in 0.7% of patients (n=33) in the thrombectomy group compared with 0.3% in the PCI-alone group (n=16).

Outcomes for patients with STEMI receiving PCI plus thrombectomy were not significantly better than those receiving PCI alone. However, the risk of stroke was greater.
Jolly S, Cairns J, Yusuf S, et al. Randomized trial of primary PCI with or without routine manual thrombectomy. *NEJM* 2015; 372: 1389–98.

Rapid vitamin K antagonist reversal

Rapid reversal of vitamin K antagonist (VKA)-induced anticoagulation is often necessary for patients requiring urgent surgical or invasive procedures. In many countries, plasma is the most commonly used agent for rapid reversal however, four-factor prothrombin complex concentrate (4F-PCC) may be a suitable alternative.

To establish their comparative efficacy, a multicentre randomised trial assigned 181 patients requiring rapid VKA reversal, in a 1:1 ratio to receive either plasma or 4F-PCC. The primary endpoints measured effective homeostasis and rapid INR (international normalised ratio) reduction (<1.3 at 30 minutes after infusion end).

Significantly more patients in the 4F-PCC group (90%), compared with 75% of the patients in the plasma group, achieved effective haemostasis. Further, rapid INR reduction was achieved in 55% of patients in the 4F-PCC group versus 10% in the plasma group.

4F-PCC is superior to plasma for rapid INR reversal and effective haemostasis.
Goldstein J, Refaai M, Milling T, et al. Four-factor prothrombin complex concentrate versus plasma for rapid vitamin K antagonist reversal in patients needing urgent surgical or invasive interventions: a phase 3b, open-label, non-inferiority, randomised trial. *Lancet* 2015; 385: 2077–87.

CPD Challenge

See page 38 to test yourself on this article

Paediatrics

Antibiotic regimens for infants with serious bacterial infections

Many families from resource-poor settings with infants who are severely ill as a result of bacterial infections cannot accept hospital referral. In such cases guidelines suggest 7 days of injected procaine benzylpenicillin–gentamicin.

A sub-Saharan Africa trial assessed whether simplified antibiotic regimens may be as effective as standard antibiotic treatment for serious bacterial infections. A total of 3564 children were allocated to receive either injectable procaine benzylpenicillin–gentamicin for 7 days (reference group); injectable gentamicin and oral amoxicillin for 7 days (group B); injectable procaine benzylpenicillin–gentamicin for 2 days, then oral amoxicillin for 5 days (group C); or injectable gentamicin for 2 days and oral amoxicillin for 7 days (group D).

A total of 8% of children in the reference group failed treatment, compared with 6% in group B, 8% in group C, and 5% in group D. Fatality rates across the groups ranged from 1 to 2%.

The three simplified antibiotic regimens were as effective as injectable procaine benzylpenicillin–gentamicin.
Tshefu A, Lokangaka A, Ngaima S, et al. Simplified antibiotic regimens compared with injectable procaine benzylpenicillin plus gentamicin for treatment of neonates and young infants with clinical signs of possible serious bacterial infection when referral is not possible: a randomised, open-label, equivalence trial. *Lancet* 2015; 385: 1767–76.

Oral propranolol for infantile haemangioma

Infantile haemangiomas are the most common soft-tissue tumours of childhood. Propranolol is first line therapy but current evidence assessing its efficacy is sparse.

In response, a randomised trial enrolled 460 infants with an infantile haemangioma. Each infant was then assigned to receive either placebo or one of four different oral propranolol regimens (1 or 3 mg of propranolol per kg per day for 3 or 6 months). The primary endpoint measured treatment success at 24 weeks.

The most effective propranolol regimen was 3 mg per day for 6 months. The frequency of successful treatment with this regimen was dramatically higher than with placebo treatment (60% vs 4%). A total of 88% of patients receiving the most effective propranolol regimen showed improvement by week 5 compared with 5% of patients receiving placebo. Propranolol-associated adverse events occurred infrequently.

Oral propranolol was effective at treating infantile haemangioma.
Léauté-Labrèze C, Hoeger P, Mazereeuw-Hautier J, et al. A randomized, controlled trial of oral propranolol in infantile hemangioma. NEJM 2015; 372: 735–46.

Cerebral malaria: brain swelling and death

Case fatality among African children with cerebral malaria remains around 15–20%. Although the pathogenic processes behind these fatalities are unknown, it is thought that increased brain volume may lead to increased intracranial pressure.

Therefore, a magnetic resonance imaging (MRI) study was conducted among children diagnosed with cerebral malaria. To monitor brain volume, each participant had an MRI obtained on admission, and daily thereafter while the coma persisted.

Of the 168 children included in the study, 25 (15%) died, 21 of whom (84%) had evidence of severe brain swelling on admission. In contrast, severe brain swelling was only seen in 27% of survivors. Serial MRI scans showed decreasing brain volumes in the survivors who had had initial brain swelling.

Increased brain volume was seen in children who died from cerebral malaria, but was uncommon in those who survived the disease. This suggests that raised intracranial pressure may contribute to a fatal outcome.
Seydel K, Kampondeni S, Valim C, et al. Brain swelling and death in children with cerebral malaria. *NEJM* 2015; 372: 1126–37.

Infection

Kidney transplantation in HIV patients

The prevalence of chronic kidney disease among HIV-infected patients is now estimated to be over 20%. In 2008, South Africa starting performing kidney transplantation from deceased HIV-infected donors to HIV-infected patients requiring renal-replacement therapy. Now the 5-year follow-up for these patients has been reported.

A total of 27 transplantation patients were included in the study. The average follow-up of survivors was 2.4 years. Each recipient had a CD4 T-cell count of over 200mm^3 and undetectable plasma HIV RNA level. All patients were receiving antiretroviral therapy.

The survival rate among patients was 84% at 1 year and 3 years and 74% at 5 years. The corresponding rates of graft survival were 93%, 84% and 84%. Rejection rates were 8% at 1 year and 22% at 3 years. HIV infection remained well controlled for the duration of follow-up.

Kidney transplantation appears to be an additional treatment option for HIV patients requiring renal-replacement therapy.

Muller E, Barday Z, Mendelson M, and Kahn D. HIV-positive–to–HIV-positive kidney transplantation - results at 3 to 5 years. *NEJM* 2015; 372: 613–20.

Life expectancy of HIV-positive patients in Rwanda

Rwanda has achieved substantial progress in scaling up antiretroviral therapy (ART). To assess the impact of increased ART coverage among HIV-positive patients in Rwanda, researchers compared life-expectancy during two distinct periods of lower and higher ART coverage (1997–2007 and 2008–2011, respectively).

In total, 72 000 patients were included in the study, contributing over 200 000 person-years of follow-up. The crude mortality rate was 33.4 deaths per 1000 years. Life expectancy for the overall cohort was 25.6 additional years at 20 years of age and 23.3 additional years at 35 years of age. Life expectancy at 20 years of age in the period of 1997–2007 was 20.4 additional years; for the period of 2008–2011, life expectancy had increased to 25.6 additional years. Individuals enrolling with higher CD4 counts had highest life expectancies.

This study demonstrates the benefit of early enrolment of HIV-infected patients in care and initiation of ART.

Nsanzimana S, Remera E, Kanters S, et al. Life expectancy among HIV-positive patients in Rwanda: a retrospective observational cohort study. *Lancet Global Health* 2015; 3: 169–77.

Valganciclovir for congenital cytomegalovirus

Congenital cytomegalovirus (CMV) infection is a common cause of sensorineural hearing loss and mental retardation. Treatment for symptomatic congenital CMV involves intravenous ganciclovir for 6 weeks. However, whether the treatment produces long-term benefits remains unestablished.

A randomised trial assessed whether prolonging treatment to 6 months with oral valganciclovir improved hearing outcomes among 96 neonates diagnosed with symptomatic CMV. Participants were then given 6 weeks of ganciclovir followed by 6 months of either valganciclovir (6 month group) or placebo (6 week group).

Results showed that at 6 months, outcomes in hearing were similar between the two groups but by 12 months, participants in the 6 month group experienced a more favourable outcome. Further, those in the 6 month group scored significantly higher during neurodevelopmental assessments.

Treatment with valganciclovir for 6 months did not improve short-term outcomes but instead improved hearing and developmental outcomes in the long-term.

Kimberlin D, Jester P, Sánchez P, et al. Valganciclovir for ymptomatic congenital cytomegalovirus disease. *NEJM* 2015; 372: 933–43.

Obs & Gyn

International trends for caesarean section

The rates of caesarean section surgery are rising worldwide. However, the causes of this are controversial, especially in low- and middle-income countries.

A recent study aimed to analyse the determinants of the rising caesarean section rates. A total of 21 countries (from Africa, Asia, and Latin America) were surveyed and then stratified according to the Human Development Index (HDI) group (very high/high, medium, or low). The results from two surveys (conducted 2004–2008 and 2010–2011) were then used for analysis.

The overall caesarean section rate significantly increased between the two surveys, from 26.4% to 31.2%. Among very high/high and low HDI countries, the use of obstetric interventions (induction, prelabour caesarean section) had also increased. The proportion of women who had previously undergone a caesarean section had risen in moderate or low HDI countries and are an increasingly important determinant of overall caesarean section rates.

Vogel J, Betrán A, Vindevoghel N, et al. Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry surveys. *Lancet Global Health* 2015; 3: 260–70.

Malaria prevention in pregnancy

In 2012, WHO guidance for intermittent preventative treatment of malaria during pregnancy (IPTp) changed to recommending monthly doses of sulfadoxine–pyrimethamine from the second trimester rather than two doses. However, the cost-effectiveness of this alteration has not been established.

In response, a modelling study has been performed to estimate the incremental cost-effectiveness of IPTp with three or more doses (IPTp-SP3+) compared with just two (IPTp-SP2).

The authors estimated that the disability-adjusted-life-years (DALY) lost for low birthweight, anaemia, and clinical malaria per 1000 women in the SP2 group was 555 compared with 442 in the SP3+ group. The delivery of IPTp-SP3+ to 1000 pregnant women averted 113.4 DALYs at an incremental cost of $825·67 producing an incremental cost-effectiveness ratio (ICER) of $7.28 per DALY averted. Further analyses demonstrated that, the ICER was $4.0 per DALY averted for high risk of low birthweight.

This study suggests a monthly dose of IPTp-SP from the second trimester is cost-effective.

Fernandes S, Sicuri E, Kayentao K, et al. Cost-effectiveness of two versus three or more doses of intermittent preventive treatment for malaria during pregnancy in sub-Saharan Africa: a modelling study of meta-analysis and cost data. *Lancet Global Health* 2015; 3: 143–53.



See page 38 to test yourself on this article

Africa HEALTH CPD Challenge

Questions

Were you paying attention? Test your retentive capacities on issues raised in this edition of *Africa Health*. You can quietly test yourself, or – and we're particularly keen on this – you could make it a part of the foundation of a Journal Club in your department or health institution. Life-long learning is a collaborative exercise and the whole health team can be positively stimulated by being involved in such discussion.

Q1. Seasonal malaria

i) Seasonal malaria chemoprevention contains a) what active ingredients and b) can be given how often to under fives?

Q2. Controlling Ebola

i) Name three of the measures which helped stop the last known chain of EVD transmission in Liberia?

Q3. Obesity

i) How much more do airlines in the USA spend annually on fuel as a result of the rise in average body weight among American adults? (bet you didn't learn this at medical school!)
   a) $75 million
   b) $175 million
   c) $275 million

Q4. Clinical Review: Pharmacy

i) Is Ebola vaccine effective in preventing the spread of infection?
   a) yes
   b) no
   c) unknown

ii). Medicines should be prescribed just to see if the patient gets better, this will tell you what is wrong with the patient? True or False?

iii).Doses of medicine should be based on a child's age? True or False?

Q5. Clinical Review: Public Health

i) Collateral deaths from the Ebola outbreak have highlighted the additional contingency planning needed when major outbreaks or natural disasters occur. Name two of the most obvious causes of collateral deaths.

Q6. Clinical Review: Dermatology

i) All epidemiological types of Kaposi's sarcoma are associated with which of the following:
   a) Human Herpes Virus
   b) Buruli mycobacteria
   c) Leprosy B virus

ii) Improved access to ART has dramatically reduced HIV-associated mortality and commencement of antiretroviral therapy (ART) earlier in the course of advancing HIV immunosuppression significantly improves outcomes. But what is the emerging complication known as IRIS?

Q7. Medicine Digest

i) Yaws is scheduled by the World Health Organization for eradication by 2020. Was the trial of a mass treatment campaign of Papua New Guinea with a single dose of oral azithromycin successful: yes or no?

Answers

Q1.
i) SMC contains amodiaquine plus sulfadoxine-pyrimethamine. It should be given monthly up to a maximum of four doses.

Q2.
i) Early detection of cases; identification, monitoring and support of contacts in acceptable settings; effective triage within the healthcare system; rapid isolation of symptomatic contacts; A sector approach which divided the district into geographic units, thus facilitating the ability of the response teams to rapidly respond to community needs.

Q3.
i) $275 million.

Q4.
i) Unknown.

ii) False. The expected treatment outcome must be considered only after a diagnosis.

iii) False. Their weight must also be considered.

Q5.
i) The three most noted additional outbreaks concerned malaria, measles, and whooping cough. In addition there were mortalities associated with the interruption in pre- and postnatal care.

Q6.
i) a) Human Herpes Virus.

ii) IRIS is the name for an ART-associated immune reconstitution associated with a paradoxical worsening of some diseases or development of a new disease. The risk of IRIS is highest among individuals who have been diagnosed with HIV late in the course of HIV immunosuppression and therefore have been commenced on ART with a low baseline CD4 count. IRIS-associated cryptococcosis and tuberculosis bring considerable morbidity. In sub-Saharan Africa IRIS-associated KS is now also a well-recognised complication.

Q7.
i) Yes. It produced a significant reduction of incidence in the disease.

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Bringing up baby (answers on page 33)

Part one

Until he was 14 weeks old Joseph was a healthy and apparently happy baby who was growing well on bottle feeding: he had been breastfed for the first eight weeks. He had taken his routine 3-month immunisations without reacting adversely to them. However, four days later his mother brought him to the doctor after he had been vomiting for around 12 hours. The vomiting had started suddenly, and during the rest of the day he had become lethargic. He was not crying nor was he irritable. There was no fever, and he had passed a normal bowel motion containing no blood or mucus around 6 hours before the vomiting had started. On examination he was of normal length and weight for his age. He was pale and there was a suggestion of epigastric tenderness, but no masses. There were bowel sounds. He was well hydrated. While he was being examined he vomited once - the material was bright green.

Q1 Before you start investigations, what are your thoughts on the differential diagnosis?

(a) Infection must be the first consideration In any infant with sudden vomiting, even without diarrhoea
(b) Bilious vomiting means intestinal obstruction until you prove that there is another diagnosis
(c) If this is an obstruction intussusception is the most likely cause
(d) An obstructed inguinal hernia is a possibility
(e) Volvulus is ruled out as it would have caused much more distress for Joseph

Part two

Q2 A straight X-ray of the abdomen revealed some air-filled loops of small bowel but no definitive pathology. How would you investigate further?

(a) Full blood count, urea and electrolytes, C-reactive protein
(b) Blood for grouping
(c) Blood and urine cultures
(d) Blood pH level, serum lactate and glucose
(e) Abdominal ultrasound
(f) Urgent referral to the paediatric surgeon

Part three

Q3 While waiting for the test results what is your initial treatment regimen for Joseph?

(a) Fluid replacement by intravenous drip
(b) Insertion of a nasogastric tube
(c) Antibiotics
(d) Urgent surgical intervention, probably by air enema
(e) Possible emergency laparotomy

Part four

Q4 His immunisations included the usual diphtheria, pertussis, tetanus, polio, haemophilus influenzae B, meningitis C, and rotavirus. Which of them (if any) have been linked to an increase in intestinal obstruction in infants of Joseph's age?

(a) None of them
(b) DTP injections
(c) Polio virus oral or injected
(d) HIB
(e) Meningitis C
(f) Rotavirus



The Future of Africa

Africa's children are the continent's most important resource. Their development is Africa's future, which makes protecting them all the more vital.

Even mild anemia in a child can lead to fatigue and lack of energy — interfering with the child's ability to learn and be active as children should be. This can have serious short-term and irreversible long-term consequences. Yet, anemia can easily be discovered. And there's no reason hemoglobin testing should be less accurate in the field than it is in the lab.

Today there's a robust testing solution for anemia, no matter where you are. The HemoCue Hb 301 kit allows convenient hemoglobin testing with the same accuracy found in a lab. That means children, once anemia has been detected, can get the treatment they need — and the chance to take an active part in the future of Africa.



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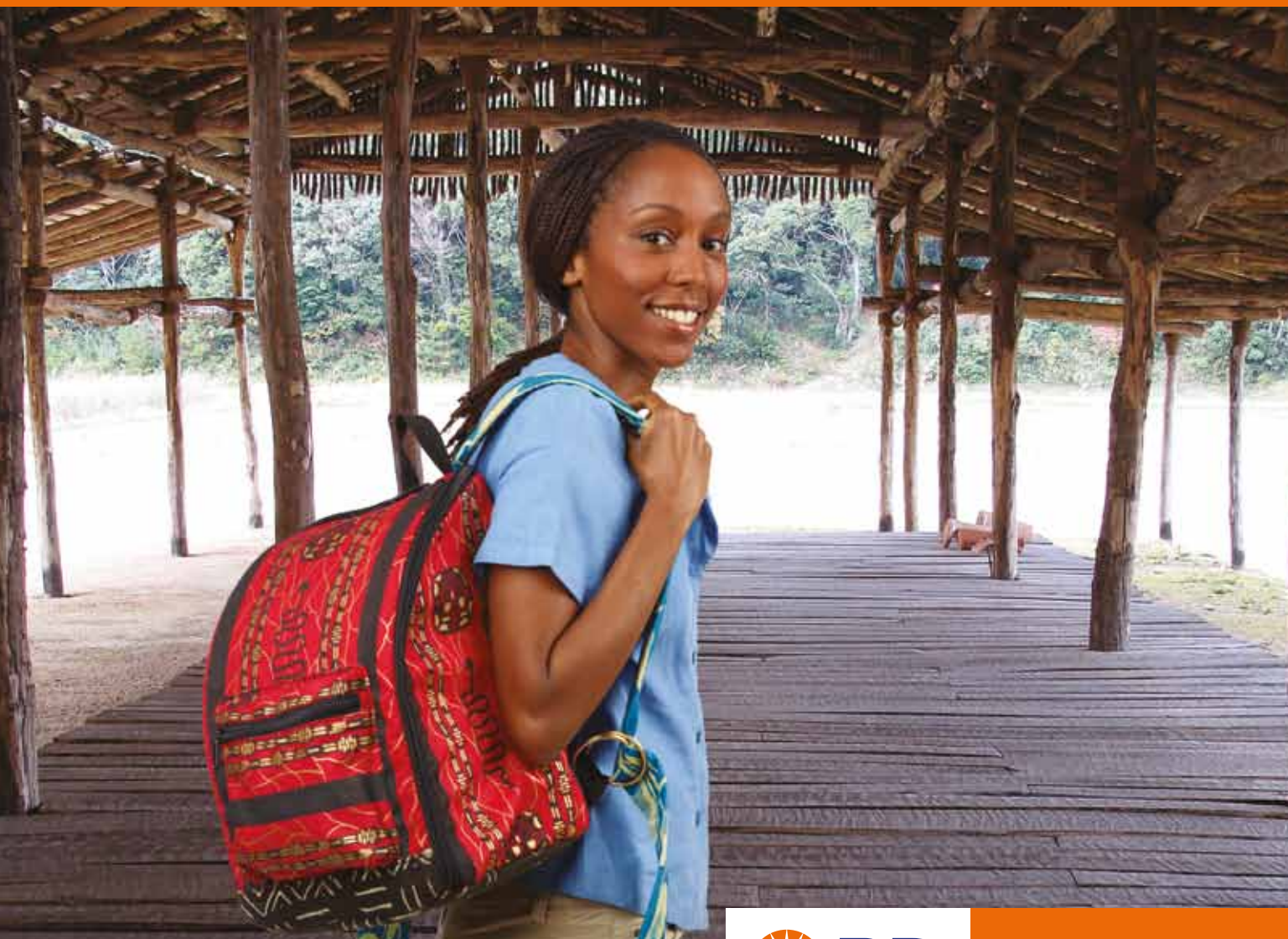
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The BD FACSPresto™ Near-Patient CD4 Counter, for example, is designed to meet the needs of resource-limited settings. It weighs just under 7 kilos, can handle extreme temperature environments, can be run off AC or battery power, and is operated using graphics, making it language independent. It allows CD4 and %CD4 monitoring and hemoglobin quantification in a single test.

The BD FACSPresto performs system self-diagnosis at each startup, which takes just a few minutes. The system is designed to eliminate the need for preventive maintenance.

Our clinical solutions are designed to deliver dependable outcomes while speeding workflow, easing operation, and reducing training requirements. They reflect our commitment to live by, reach to, and measure our products and services by ever higher standards.

To learn more about the BD FACSPresto, visit **bdbiosciences.com/eu/go/presto.**

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