Adolescent Health Research in Africa Workshop

4-5 February 2015; Wellcome Trust Gibbs Building, London, UK
Executive summary

Improving the health of adolescents (10-19 years) and young people (10-24 years) in Africa is an urgent priority, with this age group accounting for a large and growing proportion of the population and improvements in child health shifting an increasing burden of ill health to young people. Latest figures show that people aged 10-19 years account for 23% of the total population of sub-Saharan Africa and this is increasingly rapidly. In high-income countries such as the UK, the mortality rate in older adolescents aged 15 to 19 years is now much higher than in young children, while mortality rates are even higher in the 20-24 year age group. In sub-Saharan Africa as a whole, although the infant mortality rate remains very high, the mortality rate in 1-4 year-olds is only twice that in 20-24 year-olds (WHO Global Health Observatory 2015). HIV/AIDS is the leading cause of death in adolescents in Africa.

The good news is that there is growing evidence that interventions aimed at improving the health of adolescents and young people can work. More than 50 specialists from around the world, including many working in Africa, met at a workshop to share their experience and agree research priorities in adolescent health as part of planning the work of a new Adolescent Unit being established at the Africa Centre for Health and Population Studies in Kwa-Zulu Natal, South Africa over the next few months.

Key objectives of the workshop were:

- Identifying the key research priorities to address the gaps in HIV prevention and care among adolescents
- Exploring how academic partnerships can be developed
- Defining strategies to build research and clinical capacity in adolescent health with a focus on developing local capacity
- Considering the broader areas of adolescent health as part of developing a coherent multidisciplinary research strategy

Workshop participants agreed that research planning should start with an analysis of the gaps in research and healthcare for adolescents in Africa, including collating information on existing studies and programmes; analyses of data already available in the Africa Centre Demographic Information System and population based HIV surveillance data archives using an adolescent focus; and planning longer term research projects that will develop and test interventions designed to improve adolescent health. Multisectoral approaches with multiple outcomes were generally favoured.

Suggestions for research areas included:

- HIV prevention – comparing integrated service and testing with a testing only approach; uptake and effectiveness of pre-exposure prophylaxis in adolescent girls
- Sexual and reproductive health – defining the most effective and acceptable delivery of services
- HIV care – following long-term outcomes for HIV-positive adolescents and understanding the cascade of care; screening for and preventing adverse long-term outcomes
- Mental health – adapting and evaluating an intervention for HIV-positive adolescents with emotional disorders; developing an community wide intervention to improve mental health in this age group
- Violence and injury – exploring the potential benefits of a parenting programme; the impact of sexual health curricula on attitudes and relationships

The workshop considered that it is essential to network with others working in adolescent health in South Africa and more widely to enable the Unit to work collaboratively and develop academic partnerships. Communicating effectively with stakeholders, including adolescents, is key to ensuring programmes meet local needs and are acceptable. In terms of building capacity, it was agreed that a good starting point would be to adapt the short course in adolescent health run by the London School of Hygiene & Tropical Medicine and WHO to be delivered at the Africa Centre or other venues in South Africa. The Unit will also work to develop postgraduate training and post-doctoral fellowships for local researchers, training for field workers and allied health professionals and engagement programmes for adolescents.

1 United Nations, Department of Economic and Social Affairs, Population Division 2013.
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Opening the workshop, Joy Lawn, (MARCH Centre, London School of Hygiene & Tropical Medicine, London, UK) outlined the challenge. “Adolescence is a time of transition, risk and opportunity,” she told delegates. However, there is a lack of research and data in this age group. “We don’t have a lot of data to drive the research agenda. The epidemiology is not as well documented as in other age groups.” She considered a major strength of the meeting was bringing together people from different disciplines to share experience and create a shared vision and working partnerships.

Tracing the impact of HIV over time, Professor Lawn noted that there needs to be a new focus on adolescents and young people. Deaths in children younger than five have fallen to around 100,000 per year because of the success of scaling up antiviral treatment. “It’s a different world to the early days of HIV, with children with HIV now growing into adolescents. Organising care for this age group is much more ‘messy’ compared to that for younger children because of their stage of life,” she pointed out. “We need to grapple with the realities and face the challenge, looking at what works best for this age group.”

Introducing the Adolescent Research Unit

The Adolescent Research Unit provides a new opportunity to spearhead research on health in adolescents and young adults relevant to the African context as well as local needs around the Africa Centre where it will be integrated. Rashida Ferrand (London School of Hygiene & Tropical Medicine and University of Zimbabwe, Zimbabwe) told the meeting. Introducing the initiative, she explained that the Unit will focus on HIV and sexual and reproductive health at the same time as providing a platform for developing a broader research agenda in adolescents.

"Adolescents tend to fall through the gap at the moment, with the focus of research and services on children or adults"

Dr Rashida Ferrand

The new Unit is a partnership between the Centre for Maternal, Adolescent, Reproductive and Child Health (MARCH) at the London School of Hygiene & Tropical Medicine and the Africa Centre for Health and Population Studies. It is being funded by the ViV Positive Action Programme, which supports communities affected by HIV and AIDS.

The Unit will work collaboratively with other research groups, developing academic partnerships nationally, regionally and internationally. “We will develop studies that can be carried out within the Africa Centre, building on its expertise and infrastructure, as well as working with others,” Dr Ferrand explained. “We will fill in the gaps in research to benefit adolescents and collaborate with other groups to have greater impact than individual efforts,” she added. The initiative will also provide a focus for training and building capacity in research and adolescent healthcare.

In its initial stages, the Adolescent Unit will be working to identify key research priorities before writing research grants to fund studies to address these areas. As part of building capacity, it will establish PhD fellowships for African students and develop and deliver training in adolescent health as well as disseminating information and advocating for this age group. “Adolescents tend to fall through the gap at the moment, with the focus of research and services on children or adults,” warned Dr Ferrand. Networking activities will include building academic networks and linking with healthcare and other organisations.

The workshop was held to:
- Identify research priorities to address the gaps in HIV prevention and care in adolescents in the South African context.
- Identify how academic partnerships can be developed.
- Define strategies to build research capacity, develop local healthcare capacity and develop adolescent health education.
- Discuss broader areas of adolescent health and contribute to the development of a coherent multidisciplinary research strategy in adolescent health.

These will all feed into the research strategy for the Adolescent Health Unit, harnessing the experience and expertise across the entire area provided by those attending the workshop to build programmes that will make a real difference to improving the health of adolescents in Africa. “This is a golden opportunity to really focus on adolescent health,” said Dr Ferrand.

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The new adolescent unit will be a key part of future research plans for the Africa Centre for Health and Population Studies, which has established itself as a leading focus for research programmes over the last 17 years since being set up in 1998 by the Wellcome Trust in partnership with the South African Medical Research Council. The Centre carries out research on population and health issues affecting the surrounding rural population in northern KwaZulu-Natal, which has one of the highest burdens of HIV in the world. The cornerstone of several of the Centre’s programmes is a biannual demographic survey collecting data including births and deaths and an annual HIV surveillance study in adults aged 15 years and older. “But we are planning to move from primarily observational research to intervention research,” Professor Deenan Pillay told the meeting, explaining that this will underpin the strategy for the next five years that the Centre is currently developing. He added, “We are very ambitious in what we want to do.”

“Research on adolescents will be a key plank of our five year strategy,” Professor Pillay explained, noting that outputs from the workshop will inform research planning and grant applications. He pointed out that an adolescent girl in the region has an 80% cumulative lifetime risk of acquiring HIV. “This is why focussing on adolescent health is critical.” It’s fantastic that ViiV has provided support for this initiative, which we will build on with funding from Wellcome, so leveraging the effect.”

Future research projects will draw on the demographic and health surveys and build on the collection of clinical and biological data and hypothesis-led research including observational and intervention studies. “Multidisciplinary research teams are key,” he explained, noting the programmes will bring together people with expertise in a wide range of fields including qualitative sciences, statistics, clinical research, with the aim of building the research capacity of black South Africans.

The future research agenda in the Africa Centre will focus on three main areas:

- HIV elimination – building on data collection to improve the cascade of care and test interventions to see if HIV can be eliminated.
- TB transmission and drug resistance – aiming to research strategies to reduce TB transmission and improve the cascade of TB care, with particular focus on drug resistant TB.
- A society in transition – focusing on adolescence and aging, particularly in terms of HIV and non-communicable diseases, and the interaction between them. Work in this area will include research into intergenerational health issues (such as pregnancy), projects within the Adolescent Health Research Unit and programmes designed to limit morbidity associated with non-communicable diseases and assessing the impact of antiretroviral therapy on society.

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Why focus on adolescent health in Africa?

“Most policymakers are working with an outdated perspective of the world,” warned Professor David Ross (Health of Adolescents and Young People, MARCH Centre, London School of Hygiene & Tropical Medicine, London, UK). “This outdated focus has resulted in the health problems of adolescents and young people being largely neglected,” he argued, noting that this age group has little influence or power and few advocates.

There are four key reasons to focus on the health of adolescents in sub-Saharan Africa:

● Adolescents are an increasing proportion of the population. People aged 10-19 years account for 23% of the total population of sub-Saharan Africa and this is increasingly rapidly. By 2050, the region is predicted to have more adolescents than any other part of the world.

● The demographic transition in Africa means that gains in child mortality are revealing the burden of disease among adolescents and young people, which have not been decreasing as rapidly. In high income countries, the mortality rate in older adolescents aged 15 to 19 years is now much higher than in young children. For example, in the UK, the mortality rate in 15-19 year-olds in 2014 was estimated at 0.24 deaths/1000 population/year, much higher than in young children (0.16). Mortality rates are even higher in the 20-24 year age group. In sub-Saharan Africa as a whole, although the infant mortality rate remains very high, the mortality rate in 1-4 year-olds is only twice that in 20-24 year-olds (WHO Global Health Observatory 2015). The top five causes of death in 10-19 year-olds in the African region are: HIV/AIDS, road injury, meningitis, lower respiratory tract infections and diarrhoeal diseases. “HIV/AIDS accounts for a very large, and growing, proportion of deaths in this age group,” warned Professor Ross. HIV/AIDS is the leading cause of death in adolescents in Africa (Source: WHO 2014, Health for the World’s Adolescents Report).

● The epidemiological transition underlines the importance of a life course perspective. Mortality from the common childhood infectious diseases has fallen dramatically in Africa in the past two decades, but there are growing rates of non-communicable conditions associated with lifestyle factors, most of which have their origins in childhood and adolescence. “The importance of the health of adolescents far exceeds immediate mortality and morbidity,” pointed out Professor Ross. “We need to also think about risk and protective factors to improve their health as they grow older.” This means addressing risk behaviours including: alcohol, tobacco, physical inactivity, poor diet, sexual risk behaviours and lack of contraception. “Part of the reason for focussing on risk behaviours in adolescents is that this age group is evolutionarily and socially programmes for exploration and risk taking,” he explained.

● There is increasing evidence that interventions in this age group can work, although most of this evidence is currently not from Africa. Multiple approaches, such as prenatal and pregnancy programmes, classroom curricula and parent training, are often effective for more than one outcome in adolescents.6 “But a lot of previous research has got it wrong by measuring only one outcome,” Professor Ross cautioned. “We need to rethink this, by thinking about multiple outcomes.” Many of the challenges to adolescent health need social rather than biomedical intervention and may have a long lag between intervention and outcome. He concluded: “At the moment, prevention approaches that are unlikely to work in adolescents or that have not been evaluated have been used more widely than those shown to be effective.”

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8 Catalano et al Lancet 2012
9 Health for the World’s Adolescents. www.who.int/adolescent/second-decade/
Research priorities in HIV prevention and sexual and reproductive health

HIV is of pivotal importance in the health of adolescents, with recent figures showing that 35% of all new infections in people aged over 15 occur in the 15-24 age group, reported Frances Cowan (The Centre for Sexual Health and HIV AIDS Research (CeSHHAR), Zimbabwe, and University College London, UK). “In 2013, there were 5 million people aged 10-24 living with HIV,” she noted.

The incidence of HIV among young women in KwaZulu-Natal is amongst the highest in the world at 7.75% in those aged 15-29 between 2004 and 2012, putting the Africa Centre in an ideal location for researching HIV in this age group and providing information and interventions that can be translated for other areas. There are also high rates of sexual violence, high rates of migration and hotspots of transmission in the region.

HIV is the leading cause of death among young women across East and Southern Africa, with particularly high incidence in key groups such as young women who sell sex. “Preventing HIV in young adults is beneficial not only in this age group but also in their children,” pointed out Professor Cowan.

A recent review showed that effective interventions for HIV based on evidence in adolescents include: in school prevention (with high quality evidence of effectiveness); school based health services, provision of adolescent friendly health services, community based interventions and comprehensive counselling and testing to stay free from sexually transmitted infections (all with mixed results). Effective interventions in adults include: voluntary medical male circumcision, antiretroviral therapy to prevent mother to child transmission, condom use and oral pre-exposure prophylaxis (PrEP) (all with high quality evidence).

The core package in the US President’s Emergency Plan for AIDS Relief (PEPFAR) has empowerment and reducing risk at the heart of its core package of evidence based interventions for HIV prevention in girls and young women, linking in to strategies to reduce risks of sex partners, strengthen families and mobilise communities for change (see Figure 2). The DREAMS (Determined, Resilient, AIDS-free, Mentored and Safe women) programme, a joint initiative between PEPFAR, the Bill & Melinda Gates Foundation and the Nike Foundation aiming to reduce new HIV infections in adolescent girls and young women, has proposed the following interventions targeting adolescent girls: condoms, pre-exposure prophylaxis, violence prevention and post-exposure prophylaxis, HIV testing and counselling and increasing contraception mix. “There is growing evidence that oral PrEP works if it is taken as prescribed,” she reported. “Good adherence is critical for HIV protection.”

“It’s important to recognise that no single intervention has emerged that can avert most HIV infections. Combining prevention approaches will be critical to success,” Professor Cowan concluded, adding that these will combine behavioural, biomedical and structural measures. “There is a lot of potential for research to work out how best to put different interventions together,” she noted.

Key questions to consider in developing and evaluating a package of interventions targeting female adolescent are:

- Who should be targeted?
- Which interventions should be included?
- What contribution each component of the package makes to the overall impact?
- Overall impact and cost effectiveness?

During group discussion, participants suggested that a core issue was ensuring effective communication between adolescents and people delivering services and agreed that empowering girls is an essential component of any HIV prevention programme. Studies are needed to map behaviours and understand how PrEP or PEP would best work for young people. It was also agreed that programmes should be developed to engage boys and young men, including understanding where adolescent boys tend to meet up and who might best engage them in conversations about HIV prevention and sexual health, studies exploring masculinity and interventions to reduce gender based violence.

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11 Mavedzenge et al JAIDS 2014
10 Mavedzenge et al JAIDS 2014

Figure 2
Core package of evidence-based interventions for reducing HIV in women

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<tr>
<th>Community mobilisation and norms change</th>
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<td>Reduce risk of sex partners</td>
<td>Empower girls and young women and reduce risk</td>
<td>Parenting/caregiver programmes</td>
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<td>Mapping to target highly effective interventions (ART, VMMC)</td>
<td>Youth-friendly sexual and reproductive healthcare</td>
<td>Social protection (cash transfers, education subsidies, combination socio-economic approaches)</td>
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Adapted from Guidance for PEPFAR Country Teams on the DREAMS Partnership Draft February 2015
Improving reproductive health benefits the health of the mother and that of her baby, with evidence that fetal programming is associated with future risk of non-communicable diseases in adult life, pointed out Judith Stephenson (University College London, London, UK). Improved pregnancy planning is also beneficial, with work in Malawi showing that the London Measure of Unplanned Pregnancy (LMUP) score provides a useful surveillance tool and that improved scores are associated with better outcomes. She suggested that this scoring system might be used in surveillance studies as part of the work at the Africa Centre to assess changes over time, differences between groups and the effects of interventions.

Professor Stephenson reported that there is good evidence for stronger policy on pre-conception care, with research from England showing positive behaviour change before pregnancy is linked to planning and advice from healthcare professionals. She said that primary care (baby checks), community pharmacy (pregnancy tests), family planning (implant and IUD removal) and maternity services (for miscarriage) provide multiple opportunities to improve awareness and uptake of preconception interventions. However, research is needed on implementation.

Looking at research priorities for the Africa Centre in terms of projects to improve pregnancy planning and reproductive health, Professor Stephenson said that anecdotal reports suggested most young women learn about family planning after their first or second unintended pregnancy. On that basis, she proposed a community-based intervention that addresses both pregnancy prevention and pregnancy planning, to increase:

- Access and effective use of family planning (potentially measured by provider and user reports)
- Pregnancy planning and preconception health (LMUP, safe conception, red cell folate)
- Early access to antenatal care (measuring gestational age at booking, with the current median being 17 weeks).

She suggested a cluster randomised controlled trial assessing two interventions: training community care givers in ‘healthy conversation skills’ to provide information and supplies (including folic acid and emergency contraception) and, secondly, a mobile nurse clinic providing a range of family planning options and safe conception advice for women with HIV. Data collection could be analysed from the Africa Centre Demographic Surveillance System (DSS) for intervention and control clusters and this could be linked to maternity service data to follow-up women who become pregnant. In addition, a nested cohort of women planning a pregnancy could be followed-up intensively to investigate how preconception health status influences fetal programming.

The Africa Centre has several assets making it a good focus for this type of research. It has an existing system of community care givers that could be further trained. Mobile clinics already operate in the community and these would be able to recruit more nurses. The Demographic Surveillance System provides a rich source of data and it is going to link to maternity services. The Centre has an existing pregnancy cohort study investigating quality improvement with training of healthcare professionals, and there is a natural control group in pregnancy cohort members outside the DSS. There is also the capacity to integrate with other research plans.

Group discussion noted that adolescents are very unlikely to have planned pregnancies and may find it difficult to relate to community caregivers, who are often older women. It was suggested that services for adolescents might be provided at weekends, to reach adolescents at school, and may be provided by specially trained younger women. Most 10-19 year olds are at school, so providing sexual health education and services at schools is a good way to reach this age group, although it was acknowledged that this is challenging to achieve in practice. A peer-to-peer conversation approach may also be worth exploring. As a first step, it may be useful to carry out a scoping exercise exploring the barriers to providing interventions to younger girls (aged 10-14).
IV/AIDS is the leading cause of death in adolescents in Africa,” Professor Linda-Gail Bekker (The Desmond Tutu HIV Centre, Institute of Infectious Disease and Molecular Medicine, University of Cape Town) reminded delegates. She estimated that around 400 000 adolescents in South Africa are infected with HIV. “Measures to reduce HIV need to be scaleable and affordable,” she pointed out.

Testing for HIV has increased dramatically in South Africa, but people aged 15-24 years are not being tested. “We need to get adolescents to come forward for testing,” said Professor Bekker. However, there are a lot of questions on how to achieve this in adolescents and young adults, including: where is the best place for testing? Should testing be school based? How effective is self-testing? How often should young people be tested? What is the impact of gender on testing approaches? What is the potential role of buccal testing? She noted that the evidence for current guidelines is not from Africa.

Improving linkage to services is important, with a study from KwaZulu-Natal showing that young people find it difficult to link to services. Barriers exist at an individual level, as well as in healthcare systems and in other structural factors. “How can we make services youth friendly, including being non-judgemental?” she challenged delegates. Key measures to improve linkage to services include: providing more integrated services, with a one-stop shop approach; improving navigation, with greater use of peers and community care workers; group activities, including buddies and encouraging young people to go in groups to access services; communication by social media; age-appropriate counselling; disclosure; tracking, including use of cell phones; cash incentives; and greater provision of community based services.

In terms of HIV treatment, adolescents struggle to keep to programmes and have low adherence to therapy. Professor Bekker suggested that the ideal regimen for this age group is one a day or even once every 12 weeks (by intramuscular injection). It should have few side-effects, a high resistance bar and also be compatible with long-acting reversible contraceptives, TB drugs and pregnancy. “We also need options for second and third line treatment,” she said, noting high rates of resistance in 11-24 year olds treated in Cape Town clinics. Management of toxicities is also important, including monitoring effects on cognitive function, short-term toxicities, metabolic effects and checking the effects of long-term antiviral exposure. In addition, more work is needed to understand viral load monitoring in adolescents, when to start treatment and the potential for drug holidays.

HIV and disability in adolescents in Africa

“Five per cent of adolescents, and up to one in three adolescents with HIV, have some disability,” warned Hannah Kuper (International Centre for Evidence in Disability, London School of Hygiene & Tropical Medicine, London, UK). She argued that disability associated with the long-term effects of HIV and treatment is currently very neglected, particularly in children and young people. Figures from clinic consultations for parent reported disability show that children who are HIV-positive have more than eight times the prevalence of disability compared to HIV-negative siblings (33% vs 7%, odds ratio 8.3). These disabilities were wide ranging, including effects on vision, hearing, physical capacity, learning and speech. However, despite the high figures, 67% of the children with disability had never received rehabilitation even though they were being seen regularly at a clinic.

“Disability has a major impact on education,” pointed out Dr Kuper, often because children with disabilities are less likely to attend. She noted that there has been limited research on HIV and disability in children, but those studies that have been carried out have shown associations with developmental delay, sensory and locomotor impairments. “The evidence suggests there is a problem but we need more well-conducted research studies in children and adolescents,” she suggested. Studies need to include: the epidemiology of HIV and disability, access and referral to rehabilitation, and the efficacy and delivery of appropriate prevention, treatment and rehabilitation interventions.

12 Devendra et al PLoS ONE 2013
It is important to integrate HIV into chronic disease care because the effects of HIV and antiretroviral medication on a range of factors, including lipids, glucose, adipose tissue and renal function, leads to a co-epidemic of cardiovascular disease, pointed out Maryam Shahmanesh (University College London, London, UK). There are three intersecting major health risks in young people aged 15-24 in South Africa: vertically transmitted HIV, risk factors for non-communicable diseases including smoking and alcohol and sexual health risk, including very high HIV incidence (see figure 3).

There are major opportunities for improving the prevention and management of chronic disease in young people with HIV, Dr Shahmanesh argued. The opportunities in this field include the large number of young people affected (both newly and vertically infected), the intersection of epidemics, linked clinical, laboratory and demographic platforms and the fact that an NCD programme is already being developed. The challenges include the need for very long term care and the huge mobility in this age group.

Key research questions to explore in HIV and chronic disease care are:

- The biology of HIV and noncommunicable diseases, both in newly infected and vertically infected adolescents
- Clustering of risk and integrated prevention of NCDs and HIV in young people – ideally looking at multiple outcomes
- Health delivery and integrated models of management of NCDs and HIV for young people
- Interventions for geographical / place-based risk environments and case-based management of mobile individuals needing very long-term care.

Neglected adolescent health research priorities

Mental health

“Mental health is coming of age,” suggested Ricardo Araya (LSHTM, London, UK). He added, “Mental health is a very relevant topic in adolescents.” During a lively discussion session, delegates reported that there is currently no mental health care in many regions of Africa and agreed that simple tools were needed to diagnose mental health problems in adolescents, in addition to interventions that could be used by community care workers and community counsellors. There is a complete lack of data on the extent of mental health problems, including suicide, depression and anxiety, and alcohol and substance abuse in adolescents in Africa, and poor information on the long-term impact of HIV and treatment on mental health.

Integrating mental health care into HIV adherence support was considered important because non-adherence is often associated with mental health issues and may be resolved with approaches such as cognitive behavioural therapy.

"Integrating mental health into other services and programmes is important,” agreed Professor Araya. Prevention of mental health problems is also important, delegates agreed, recommending interventions to build emotional resilience and coping skills. Research projects could usefully collect data and test interventions (ideally with outcomes across several risk factors) in adolescents across all of the areas suggested, they suggested. Families are also an important focus, with parental deprivation having a huge impact on a child’s mental health as well as general health.

Violence and injury

Road injury, self-harm and interpersonal violence are in the top five causes of deaths in adolescents, according to global figures reported by Jane Ferguson (World Health Organization Department of Maternal, Newborn, Child and Adolescent Health, Geneva, Switzerland).

Road injuries account for 16.27 deaths per 100 000 each year in adolescents aged 10-19 years, with even an even higher rate (20.42) in those aged 15-19 years. Adolescents are at high risk for road traffic injuries because they are more likely to engage in risky behaviour both as pedestrians and as drivers. Their inexperience on the roads and susceptibility to peer pressure further exacerbates this risk.

What can help to reduce this risk? Effective measures include: setting and enforcing laws on seat belt use, speed, use of mobile phone, and wearing helmets on motorcycles; supporting legislation with social marketing campaigns.
specifically targeted at adolescents and young adults; improving road construction, with pedestrian crossings and speed bumps; reducing speed around schools; tighter drink driving laws; and graduated driver licensing schemes for novice drivers. Ms Ferguson suggested that more research evidence is needed on the effect of prevention strategies, including brief interventions in emergency settings (such as just after a non-fatal accident), alcohol prevention activities and use of social media messaging.

Interpersonal violence is also a major cause of death in young people, accounting for 17.18 per 100 000 deaths each year in those aged 15-19 years, with an even higher rate in young men. Intimate partner violence is common, affecting around 40% of girls aged 15-19 who have ever had a partner. "An important intervention to prevent violence among adolescents is supporting improved skills of parents throughout childhood and adolescence," reported Ms Ferguson. She explained that there is good evidence for this approach to violence prevention but poor evidence on implementation, adding that there is huge demand for parenting activities in South Africa. It can have multiple outcomes, reducing sexual risk behaviour and substance abuse as well as violence, she concluded.

**Intervention studies and operational research in HIV and SRH**

Reviewing key factors in intervention and operational research in HIV and sexual and reproductive health, Helen Weiss (London School of Hygiene & Tropical Medicine, London, UK) noted that there are several interacting causes of HIV risk and vulnerability but many prevention strategies focus on individual behavioural and biomedical factors rather than addressing the wider context, including social, cultural and structural factors. She suggested there are a variety of places to intervene, and people who can be involved, to reach adolescents and young people, including:

- **School-based projects** – including conditional cash transfers and sports based programmes for voluntary male medical circumcision (VMCC)
- **Community based programmes** – such as sports-based projects, community caregivers, HIV testing and adherence clubs
- **Youth friendly clinic based interventions** – including mobile clinics, VMMC projects, family planning, HIV testing, ART adherence/retention, and mental health
- **Structural approaches** – alcohol reduction, microfinance, interpersonal violence
- **Individual** – PrEP, treatment regimens, comorbidities.

Considering research design to evaluate combination prevention interventions, Professor Weiss said that a before and after approach may be more realistic than randomised trials. She added that it is important to consider the impact of overlapping interventions in a relatively confined area or population and plan a strategy to allow for this.

When planning implementation research it is essential to have a clear understanding of the facilitators and barriers to implementing an intervention and how to most effectively scale up treatment at the same time as ensuring quality. Researchers should consider the models of care that are most suitable for the target population. "It is all about context," Professor Weiss told the workshop.

In developing new research at the Adolescent Unit within the Africa Centre, including that using existing data from the DSS, she suggested asking the following questions:

- Why carry out this research at the Africa Centre?
- How does this fit in with the current scientific strategy of the Unit?
- How does this draw on existing work at the Africa Centre?
- How would the local community define their needs?

"Either do large studies with lots of outcomes that are widely translatable or small studies with a few outcomes," she concluded. "The focus on adolescents is what will make this research unique," she added, noting that a practical approach may be to embed a study within a larger trial.

During discussion, participants agreed that intervention studies should aim to have multiple outcomes. Adolescents tend not to access health services so holding programmes at other venues, including at school, may be more effective. It was considered essential to engage local communities in setting priorities for interventions.

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The ALPHA Network

The Analysing Longitudinal Population-based HIV/AIDS data on Africa (ALPHA) programme is a network of 10 demographic surveillance systems at different sites all collecting HIV data longitudinally. "The programme is starting to compare sites and has pooled data for 45 000 people who are HIV-positive and have been followed up over time," reported Vicky Hosegood (The Africa Centre for Health and Population Studies, South Africa and the University of Southampton, UK). The Gates Foundation funded project is investigating why HIV-positive people are dying in the era of antiretroviral therapy. The data will be analysed to determine whether people die before diagnosis, while on treatment or after stopping treatment. A further project is going to look at children and adolescents.

Themes include: improving estimates of HIV incidence and treatment in HIV cohorts; effects of adult HIV infection, treatment and mortality on migration, care and health of children and adolescents; demographics and social patterns in children’s health and welfare, including secular changes (such as schooling) exacerbating or mitigating effects of direct or indirect exposure of children to HIV.

Data on child and adult migration collected so far show that 37% of adult householders are non-resident and 18% of children under 18 years. Migration is common in young babies as they travel with their mothers to their work. It increases again from the age of 10 due to travelling away for schooling and then increases rapidly from the age of 15. "This means it is essential to follow children if they are in studies of HIV positive mothers, because the children may migrate,” pointed out Dr Hosegood. She noted that death of a parent increases child migration.

Exploring what migration means for HIV, Dr Hosegood suggested that it is an important factor in provision of support for adherence. She proposed that it is useful to study which children are migrating and to understand child migration in the context of parental co-residence and migration between ‘stretched’ households. Dr Ferrand commented that this type of information helps to break down stereotypes and underlines the need to understand migration before trying an intervention. "A strength of the Africa Centre is the understanding of the social situation,” she said.

Building programmes to promote adolescent health

Supporting programmes to build better health that target areas of unmet need is a key focus of the Positive Action Programme supported by ViiV Healthcare, an independent company combining the HIV expertise of GlaxoSmithKline, Pfizer and Shionogi. "Our projects aim to achieve better outcomes for people and are based on research and interventions implemented by our partners across the globe," explained Dominic Kemps, Director of ViiV Healthcare’s Positive Action for Women & Girls programme, which is supporting the development of the new Adolescent Unit at the Africa Centre, together with ViiV’s Positive Action for Adolescents programme.

Illustrating the organisation’s commitment to deliver innovation in the areas of highest unmet need, Dr Kemps reported on ViiV’s £10 million Paediatric Innovation Seed Fund that supported projects focusing on expanding the evidence base for paediatric care and treatment and the development of paediatric fixed-dose combinations that can be supplied as generics for children living with HIV worldwide. One project with the International AIDS Society CIPHER research programme is aiming to answer remaining clinical and operational research questions needed to improve the clinical management and delivery of HIV services for infants, children and adolescents, supported by a new funding stream from ViiV.

These projects have underlined the need to improve the focus on adolescents, Dr Kemps told the workshop. A UNAIDS multi-stakeholder meeting in May 2014 set the goal for ‘no adolescent living with HIV to be left behind’ and defined the agenda for work in the field to focus on improving access to HIV testing for this age group, expanding treatment options and adapting services to meet the needs of adolescents and young adults. He explained that ViiV is providing an initial two years of funding to the Adolescent Unit at the Africa Centre to help define and start research programmes and interventions that will improve health outcomes for this age group.
Building capacity

Building capacity in adolescent health is one of the aims of the new Adolescent Unit at the Africa Centre. Exploring what this might mean, Bruce Dick (Independent consultant in adolescent health affiliated to Johns Hopkins University, Baltimore, USA) suggested that it is more than training and includes supervision, support and mentoring. He suggested that it is also more than knowledge, incorporating skills, experience and transformation, and can operate at various levels and with many outcomes.

Dr Dick suggested that the Unit needs to determine what capacity it wants to strengthen. This potentially including the capacity of people to do top class research, the capacity of policy makers and community leaders to support research interventions. Additionally, it might include the capacity of programmers to plan and monitor interventions, that of health workers to implement interventions and the capacity of adolescents for advocacy and activism.

It is also important to plan whose capacity needs to be developed: people already being trained through existing development programmes (such as health workers for adolescent friendly health services), people with existing research skills to carry out research on adolescents, people implementing specific intervention research projects or creating a critical mass of adolescent health champions. His suggestion of adapting the short course on adolescent health in low- and middle-income countries run by the LSHTM and WHO to be delivered through the Africa Centre as part of building capacity was universally supported by workshop delegates. It was also agreed that it was vital to develop the research skills and expertise of black South Africans as part of building local capacity.

Building networks

It is essential for people working within the new Adolescent Unit at the Africa Centre to network effectively with others working in adolescent health and those working in other relevant areas, suggested David Ross (Health of Adolescents and Young People, MARCH Centre, London School of Hygiene & Tropical Medicine, London, UK). He advised building on existing networks and being strategic, particularly in the early stages, to get adolescent research and training off the ground and achieve tangible outputs quickly.

During discussion, delegates discussed how best to develop networks. Strategies included: mapping organisations and other researchers relevant to planned research areas before starting on a study; once a research project is underway, sharing ideas, protocols and data, for example Professor Bekker said her group had a couple of PrEP protocols they could share; real or virtual meetings. The idea of setting up an adolescent health group in South Africa was suggested as there is currently no research group with this focus. Dr Ferrand said the Africa Centre is planning a South African meeting where people will be able to present their work in adolescent health.
Workshop recommendations for research questions, building capacity and developing networks

Discussion groups at the workshop agreed priorities for research questions that the new Adolescent Unit at the Africa Centre should consider focusing on in its early stages. They also proposed strategies for building capacity in adolescent health and for developing effective networks in the field.

**RESEARCH QUESTIONS TO CONSIDER**

**HIV prevention**
- Integrated service and testing vs test only (venue based)
- Increased uptake of MMC +/- linked to masculinity coaching
- Uptake and effectiveness of PrEP in risk-profiled 16-24 year old girls vs universal offer (CRT)

**Sexual and reproductive health**
- Effective and acceptable delivery of sexual and reproductive health services (school, community, mobile)
- EPI and acceptability of FP methods (including EMOC)
- Feasibility of vaginal sampling

**HIV care**
- What are the long-term outcomes for HIV+ adolescents?
- What is the cascade of care for adolescents with HIV?
- How can we screen for deleterious long-term outcomes (based on 1 and 2)?

**Mental health**
- Understanding community responses to adolescents with emotional disorders
- Adapting and evaluating an intervention for HIV+ adolescents with emotional disorders
- Writing proposal for community wide intervention for adolescents with emotional disorders

**Violence and injury**
- Does an adapted parenting programme for young parents reduce violence and increase skills?
- Does the new sexual health education curricula lead to improved attitudes and relationships
- Test feasibility of adapting HEARD/violence plus livelihoods intervention - assess impact on violence, alcohol and income

**Further questions/issues to explore**
- Where are the adolescents in this? eg empowered
- Qualitative studies across topics
- Improving mortality in HIV+ (linkage)
- Cascade of care in adolescents (ALPHA)
- Make links across 5 topics eg parenting
- How are FP methods actually being used?
- Cascade into prevention for HIV negative adolescents

**TRAINING AND CAPACITY STRENGTHENING**

**Courses for clinicians and programme managers**
- LSHTM/WHO adolescent short course run in the Africa Centre (decide if MSc relevant)
- Adolescent health training for clinical staff

**Postgraduate research posts/training**
- Postgraduate training: Masters, PhDs – need advocacy campaign to recruit Black South Africans
- PhD for African scientists (joint schemes with other South African universities)
- Post-doc fellowships
- Qualitative training – MSc/PhD?
- Training of adolescent researchers

**Training for field workers and allied health professionals**
- Hands-on qualitative training for field workers
- Mental health training for allied health professionals
- Short courses (various audiences)

**Training for adolescents**
- Young Scientists’ programme – similar to LSHTM public engagement – invite adolescents from local schools for two weeks’ work experience and short project at the Africa Centre – also provides direct adolescent input into the work of the centre

**DEVELOPING NETWORKS**
- Learning from others about younger adolescents > extend surveillance down
- Look in South Africa for what is being done and who by (mapping)
- Share data/ideas/protocols > multicentre studies or similar studies
- Share students
- Discuss ideas with others in South Africa
- Hold a meeting on adolescent health
- Set up a virtual network
- Involve other organisations – Department of Health, UNICEF, UNFPA
- Establish a steering committee for the virtual network to streamline communication.
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