

Designing routine health check-ups for adolescents in Zimbabwe

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Conflict of interests

The authors declare no conflicts of interest.

Authors' contributions

DR, RAF, GH, HW, AD, and KK conceptualised the study. DR was the Principal Investigator of the cross country study, and RAF and GH were Principal Investigators of the Zimbabwe study. RC, MT, TC, CN, and CS conducted data collection, coordinated by RC, and together with CMY and GH held analytical discussions. CMY and RC conducted detailed data analysis.

AM and BM provided guidance and support for the study and facilitated data collection. DR, RAF, GH, HW, KK, RC and CMY contributed to the investigator workshops. CMY wrote the paper. All authors commented on and approved the final version.

Designing routine health check-ups for adolescents in Zimbabwe

Abstract

Purpose

The absence of routine health check-ups during adolescence in low- and middle-income countries is a missed opportunity for prevention, early identification, and treatment of health issues, and health promotion. We aimed to co-design the content and delivery for routine adolescent health check-ups in Zimbabwe, with adolescents and key adults in their lives.

Methods

We held participatory workshops with adolescents (16 workshops; 96 adolescents) and parents (8 workshops; 95 parents), and in-depth interviews with key informants including policy makers, programmers and healthcare workers (n=25). Analysis was iterative and the design of the check-ups was refined based on participant preferences, document review of burden of disease data, and feasibility considerations.

Results

Participants overwhelmingly supported the introduction of routine health check-ups. Reported facilitators to attendance included free cost and desire to know one's health status. Barriers included tendencies for health service-seeking only when ill, fear of diagnosis and judgement, and religious beliefs. Delivery preferences were by non-judgemental medical professionals, in a youth-friendly environment, and accompanied by youth engagement activities. Preferred location was schools for younger adolescents (10-14 years), and community settings for older adolescents (15-19 years). Prioritised content included sexual health, oral health, mental health,

hearing, eyesight, growth and nutrition, anaemia, immunisation, and deworming, based on health burden and participant preferences.

Discussion

This study resulted in an outline design of two routine health check-ups with stakeholders in Zimbabwe, in schools for young adolescents and in community settings for older adolescents. Evidence of feasibility, effectiveness and cost-effectiveness of such check-ups is required.

Implications and contribution summary statement

This paper demonstrates widespread stakeholder support for routine adolescent health check-ups in Zimbabwe. Two health check-ups in early and late adolescence were designed through an iterative participatory co-design process. The final design included delivery in schools and communities, by medical professionals, screening for a range of health issues.

Introduction

In low- and middle-income countries many people pass through adolescence without receiving preventive or promotive health services (1). Adolescents who do attend health services, often do so late due to multiple barriers including lack of money for transport or for health service payments, needing permission from an adult, or reticence to disclose health concerns to health providers (2-4). This is a missed opportunity for health services to identify and treat health problems early and for adolescents to develop positive health care seeking behaviours.

Although the World Health Organization (WHO) has clear, evidence-based guidance that national public health systems should provide routine health check-ups for young children and older adults (5), guidance is lacking for adolescents. Investment in child health has resulted in impressive reductions in childhood morbidity and mortality (6, 7). In high-income countries, routine adolescent preventive health interventions, largely school-based, have been shown to have some efficacy for sexual and reproductive health (8), preventing unhealthy behaviours such as smoking (9) and alcohol abuse (10), and for mental health (11). WHO provides guidance for countries to develop tailored adolescent health programs (12), but does not provide specific guidance on whether routine health check-ups for adolescents should be conducted, and, if so, their content and method of delivery. Despite a strong theoretical case (13), empirical evidence is lacking on the delivery channels, the detailed content in different contexts, the most appropriate ages for adolescent health check-ups, and their acceptability, feasibility and effectiveness (14).

Zimbabwe has a population of 13 million people, of whom 28% are adolescents (aged 10-19 years) (15). Primary health care services for adolescents are available through public sector, nurse-led primary care clinics. Barriers to service accessibility for adolescents and their caregivers in Zimbabwe include user fees (currently approximately \$5USD per consultation),

overburdened clinics, and healthcare providers being perceived as judgemental (16). Nationally, Zimbabwe has few policies and programs to support adolescent health services, although sexual and reproductive health is better resourced, and a school health policy was launched in 2018 (17). Age- and sex-disaggregated prevalence data are lacking on many adolescent health conditions. In Zimbabwe, school attendance drops during adolescence, from 93% and 99% for 12 year-old boys and girls respectively, to 75% and 69% for 16 year-old boys and girls respectively, and 44% and 38% for 18 year-old boys and girls respectively (15).

The aim of this study is to understand whether routine adolescent health check-ups are likely to be acceptable in Zimbabwe, and if so, what the content should be and what delivery approach might be best suited to the local context. This study was part of a multi-country research programme conducted in Zimbabwe, Tanzania and Ghana, to define the content and delivery strategies for two health check-ups, one in young (10-14 years) and one in older (15-19 years) adolescents that will later be evaluated for feasibility, effectiveness and cost.

Methods

Data collection

The study consisted of: i) document review; ii) interviews with key informants; iii) participatory workshops with adolescents and parents; iv) investigators workshops.

Document review

Firstly, in addition to a scoping review that was conducted at global level, we conducted a review of existing reports to assess current knowledge of Zimbabwe-specific policies and care provision in the published and grey literature, including those suggested by key informants. This provided data on the prevalence of health conditions in Zimbabwe (presented in Table 4),

to understand the clinical importance of the content of the two proposed health check-ups, one in early adolescence and one in late adolescence.

Interviews with key informants

Secondly, interviews were conducted with key informants (n=25). These included interviews with staff of the Ministry of Health and Child Care (MoHCC) (n=3), Ministry of Primary and Secondary Education (MOPSE) (n=7), Community Based Organisations (CBO) (n=7), healthcare workers (HCW) (n=5), healthcare specialists (n=2) and a local government administrator (n=1). The interviews gathered information about policies and services currently available for adolescents and programs that are already offering health screening or check-ups to adolescents. Additionally, the interviews elicited views on the preferences, likely relevance, acceptability, and foreseeable facilitators and barriers to the delivery of routine health check-ups for adolescents. Interviews were conducted by an experienced social science researcher (RC) using semi-structured topic guides. Detailed interview summaries (18) were written up within one day after each interview, including notes on topics discussed, the interviewer's reflections and observations about the interview process, and the key emerging themes.

Participatory workshops with adolescents and parents

Thirdly, participatory workshops were conducted with adolescents (16 workshops, total 96 adolescents), parents of adolescents who had not been enrolled into the study (8 workshops, total 95 parents) and other key informants (1 workshop, total 18 key informants, including teachers, programmers from non-governmental organisations, district administration representatives, and policy makers from Ministries of health, education, labour and police). Workshop held separately with four groups of younger adolescents (aged 10-14 years) and with four groups of older adolescents (aged 15-19 years). Each adolescent attended two workshops,

spaced one week apart (8 workshops in total with younger adolescents, and another 8 groups in total with older adolescents). On the morning of each workshop, research assistants walked from household to household, starting from the workshop location in each community, to ask if adolescents within the age-range lived there, and, if so, to seek their and their parents' consent to participate in a workshop later that day. The aim was to recruit a balance of male and female adolescent and parent participants, although slightly more adolescent males participated (25/47 10-14 year olds, and 31/49 15-19 year olds were male) and slightly fewer male parents participated (18/46 parents of 10-14 year olds, and 21/49 parents of 15-19 year olds were male). Workshops were mixed gender. Adolescent workshops had 11-13 participants; parent workshops had 10-14 participants; the key informant workshop had 18 participants.

For each group, at the first workshop, participants were presented with the basic idea of routine adolescent health check-ups, and asked their views on introducing such routine check-ups, reasons for those views, and their priorities for adolescent health. The second workshop included a summary of lessons learnt from the interviews and previous workshops and sessions to design of the routine adolescent health check-ups. These included exercises where participants placed tokens on charts to indicate preferences for: i) the venue of the health check-up (participants could place one token on their preferred venue); ii) the cadres of professionals delivering it (participants could place one token on their preferred provider); and iii) health issues that should be included in the check-up content (participants could place between one to five tokens, either on one, or across different, priority health issues). Participants subsequently explained their preferences.

Four workshops were conducted with four groups of parents of younger adolescents, and four workshops were conducted with four groups of parents of older adolescents. Each parent/

caregiver attended one workshop (total of four workshops with parents/ caregivers of younger adolescents, and another four workshops with parents/ caregivers of older adolescents). These included similar topics to the first of the adolescent workshops and additionally discussed the reasons why a parent would or would not want his or her adolescent to attend a routine health check-up. One workshop was held with key informants (including teachers, programmers from non-governmental organisations, district administration representatives, and policy makers from Ministries of health, education, labour and police) to discuss the design of the routine health check-up that had been suggested by adolescents and their parents. Data from workshops were captured through written summaries including discussions held in each session, facilitators' reflections and observations about the process, and the key emerging themes. The workshops were facilitated by a team of four research assistants (MT, TC, CN and CS), two of whom were young researchers, while two were more experienced researchers (age range 24-39 years). One research assistant lived in the research community.

Due to COVID-19 related restrictions, most in-depth interviews (IDIs) were conducted over the phone, and the workshops were conducted outdoors with physical distancing and use of face masks and hand sanitizer.

Investigators workshops

Lastly, two investigators workshops (the first lasting two days, the second lasting four days) were held with the multi-country research teams (research teams in Zimbabwe, Ghana, and Tanzania, coordinated by the World Health Organization) to consolidate data generated through the interviews and workshops with considerations on clinical importance (based on prevalence data from the desk review), and anticipated feasibility, effectiveness, cost, and availability of accessible referral services. One main outcome of these workshops was a

proposed design of the two routine adolescent health check-ups (presented in Table 5). Health conditions were selected for inclusion, although the final package would depend on context-specific availability and accessibility of services.

Setting for adolescent and parent workshops

Adolescent and parent participants were recruited from four communities within Chitungwiza. Chitungwiza is a satellite city 25km south of the capital city, Harare, and is the third largest city in Zimbabwe, after Harare and Bulawayo, with a range of socio-economic conditions (19). It has one district-level hospital, four primary care clinics and three private hospitals and surgeries (19). Four study communities were selected during community stakeholders sensitisation meetings with local authorities, district level policy makers from the Ministry of Primary and Secondary Education, and Ministry of Health and Child Care, and programmers from community based organizations working in Chitungwiza. The stakeholders were asked to classify Chitungwiza into the three economic strata (high, medium and low) and then select the schools and their catchment areas which would be most representative of the community. A community advisory board advised on study procedures, and gave insight on their perceptions of the available health services.

Ethics and regulatory approvals

Ethics approval was obtained from the WHO Ethics Review Committee (ERC.0003284), the Medical Research Council of Zimbabwe (MRCZ/A/2560) and the London School of Hygiene and Tropical Medicine (LSHTM/A/18058). Written informed consent or assent, using age-appropriate language, was sought from all participants. For participants under the age of 18, their parents' or guardians' consent was first sought, before asking for their assent to

participate. Permissions were obtained from the MoHCC, the MOPSE, the Chitungwiza City Health Department, and the Chitungwiza District Administrator.

Data analysis

The written summaries of the interviews and workshops acted as the first step of analysis. During data generation, the research team met fortnightly to discuss key emerging findings. Data generation and analysis was conducted iteratively, whereby ideas that were generated in earlier workshops and interviews were used to refine the subsequent discussion areas in the workshops. After completion of data generation, qualitative data were manually coded and grouped under three a priori themes: i) facilitators and barriers to attending a routine health check-up; ii) preferences for delivery of routine health check-ups: where, who and how; and iii) content of routine health check-ups. Findings within these themes emerged during coding and team discussions, based on consensus agreement from across data sources. Quantitative data from ranking exercises are presented as tallies, with percentages calculated in some instances (Table 3). The priorities of adolescents, parents, and key informants from the qualitative research (Tables 1, 2, and 3) were combined with burden of disease data from the document review (Table 4) and considerations of feasibility discussed in the investigators workshops, to produce an outline design of the health check-ups (Table 5).

Results

Facilitators and barriers to attending a routine health check-up

There was general support for the introduction of routine health check-ups as “*a good idea*” and “*good practice for generations to come*” (IDI, MoHCC), across all participant categories. Adolescents wanted to know their health status “*to become free in our minds on health worries*”

(workshop with 15-19 year-olds), and to receive early treatment for any conditions that they have. Their motivation to attend such a service were perceiving that they might be at risk of particular health issues (e.g. if they had had unprotected sex) or if they had symptoms they were concerned about (e.g. if they felt depressed). A particular motivator would be free-of-cost services compared to the current situation in which any use of a health service attracts user fees: *“as long as the check-ups will be free, adolescents would go in numbers”* (workshop with 15-19 year-olds). Such routine health services were currently not widely available: only 1/47 adolescents aged 10-14 years (1 male), and 7/49 adolescents aged 15-19 years (3 male, 4 female) had ever previously accessed routine health care.

Barriers to access included the deeply-embedded belief that *“a child only goes to the clinic when he/ she is not feeling well”* (workshop with parents of 10-14 year-olds). Parents and adolescents both perceived seeking health services to be a waste of time and financial resources if they were not ill. Other barriers included the *“fear of being told you have a disease”* (workshop with 10-14 year-olds), including fear of needing long-term care and associated bills. Barriers to existing health services, including unfriendly healthcare environments, long queues, and judgemental healthcare workers further dissuaded adolescents. Financial constraints were a major barrier, both for transport to the clinic, and user fees at the clinic: *“we are already failing to provide adequate food for our children, so we cannot afford to take an adolescent who is not sick to the clinic and pay just for a routine health check-up”* (workshop with parents of 10-14 year-olds). Lower income groups were reported to have lower attendance at health care facilities, and were predicted to have lower attendance at routine health check-ups. Many adolescents thought that requirement for parental consent would be a key barrier to accessing routine health check-ups. Lastly, religious beliefs were discussed as a barrier by all stakeholders, whereby some churches, particularly the Apostolic sect, discourage healthcare

attendance, which they claim demonstrate “*you are doubting and going against the holy spirit*” (workshop with 15-19 year-olds).

When asked how to address these barriers, stakeholders in both interviews and workshops suggested clear messaging, awareness building, and sensitisation campaigns through social media, television, and radio were critical: “*if I am not aware of what is happening and if I don’t know the need of such services, I am not empowered. So, if I get educated and well informed, I will go for the services.*” (IDI, MoHCC). Importantly, participants stressed that this should include parents, including fathers, who are often excluded in messaging related to their children’s health and wellbeing, but are critical gatekeepers. Support for accessibility issues was mentioned by a few participants, with suggestions of the need for ramps and rails and sign language interpreters, where necessary.

Preferences for delivery of routine health check-ups

Where should the check-ups be delivered?

Key features to any location for the routine health check-ups were privacy, being close to home and therefore easy to travel to, and in a location where adolescents enjoyed spending time and felt comfortable. The preferred location of routine health check-ups was schools for younger adolescents and community spaces for older adolescents (Table 1). Most participants thought that “*setting up health check-ups at schools is viable*” (IDI, HCW) for younger adolescents, as there is a high rate of school attendance in this age group, so it will “*be able to reach most of the adolescents*” (IDI, eye specialist). Younger adolescents are “*used to the school environment and would likely feel motivated to access health services there*” (workshop with parents of 10-14 year-olds).

However, older adolescents feared lack of confidentiality in schools, particularly for sexual and reproductive health services. Other stakeholders acknowledged this “*fear that the teachers would use (health service uptake or diagnoses) against them*” (IDI, MoHCC), potentially resulting in stigma. Additionally, school delivery would miss non-school-going adolescents, which was a particular issue for older adolescents, who have lower school attendance. For older adolescents, community spaces, such as community halls, were therefore their preferred place for delivery of the health check-ups. These were considered central locations which many adolescents already spend time at, relatively accessible, with low transport costs and a youth-friendly atmosphere.

A minority suggested clinics, as they have the resources and facilities for health service delivery, with “*experienced nurses who know about health*” (workshop with 10-14 year-olds). However, this was not the preferred option for either age-group due to distance from home, a widely-held opinion that clinic staff tended to be judgemental and lacked confidentiality, clinics being overburdened, and perceptions that they only served ill people.

Who should provide the check-ups?

The qualities that adolescents looked for in a provider included confidentiality, expertise, knowledge and trust-worthiness. In the ranking exercises, the vast majority chose medical professionals as their preferred providers, based on their expertise, experience, training, knowledge and counselling skills (Table 2). To maximise confidentiality and minimise gossip, adolescents suggested that the providers should come from outside the community, and should receive training to avoid judgemental attitudes. Additional resources, personnel, training and capacity building were described as being essential if the addition of routine health check-ups were not to overwhelm the health system with an additional program.

How should the check-ups be provided?

In order to encourage adolescents to come for a routine health check-up, entertainment and social activities, such as sports, music and dancing, were recommended: “*sports will attract adolescents to come in numbers*” (workshop with 10-14 year-olds). Such activities attract adolescents, in part through providing an alternative reason they can provide for attendance: “*so if there are a lot of activities, who will know what they have come for*” (IDI, MoHCC). Incentives such as food, stationary, sanitary pads, money, t-shirts or hats, a voucher system and life skills programs were suggested. However, many participants noted that the offering of free services itself would be an incentive.

Content of routine health check-ups

Table 3 shows preferred content ranked according to the summed preferences of the adolescents and parents. Younger adolescents’ top priorities were hearing, mouth and teeth and sexual health. Parents of younger adolescents’ priorities were sexual health, mental health, and mouth and teeth. Older adolescents’ top priorities were mouth and teeth, sexual health and mental health. Parents of older adolescents’ priorities were sexual health, mental health and immunisation.

Sexual health services were rated the top priority amongst parents, and were highly rated by adolescents (Table 3), as adolescents “*engage in sexual activity*”, experience sexual abuse, and have high prevalence of teenage pregnancy, HIV and STIs (workshop with 15-19 year olds). Participants noted that since “*parents do not talk freely about sexuality with their adolescents*” (IDI, HCW), provision of sexual and reproductive health education was required. Although sexual health was prioritised particularly for older adolescents, the majority of participants

recognised the importance of also including some sexual health content for younger adolescents (Table 3). However, a few parents displayed resistance to inclusion of sexual health content for the younger age-group, which could be a barrier to acceptability.

Oral health was also a significant priority (Table 3). One participant unpacked these health issues as including “*bleeding gums, constant bad breath, tooth decay, mouth sores, weak teeth, and gum allergies*”, exacerbated by “*eating sweet things*” (workshop with 10-14 year-olds). Mental health was prioritised, particularly by parents of younger adolescents, older adolescents, and parents of older adolescents (Table 3). Participants noted increasing mental health issues among adolescents, but limited services. It was widely felt that adolescent depression, exacerbated by “*stress, poverty, bullying, mockery and abuse*”, was rarely diagnosed or addressed (workshop with 10-14 year-olds). Drug abuse during adolescence was highlighted as increasing mental health issues.

Testing for hearing was also thought to be important, especially by younger adolescents (Table 3), who reported hearing loss was often due to physical abuse (e.g. slapping) and exposure to dangerous objects and loud noise. Testing for eyesight was prioritised (Table 3), as early action could prevent long-term eyesight damage. Testing for both hearing and eyesight were suggested during early adolescence, as they could negatively affect schooling. However, some participants mentioned that the cost of both hearing aids and spectacles could be prohibitive, so the program would need to subsidise these.

Growth and nutrition monitoring and screening for anaemia were also selected by participants (Table 3), due to the perceived high prevalence of these conditions. Immunisation was also selected, with participants believing that “*prevention is better than cure*” (workshop with

parents of 15-19 year-olds). Specifically, delivery of the HPV vaccine for girls was highlighted. Deworming was mentioned given that “*water and sanitation is really a problem*” in the community (IDI, HCW).

Stakeholders emphasized that local availability of health services was a necessary condition for testing within a routine health check-up: “*one thing is for sure, it’s better not to test if you cannot provide them with service*” (IDI, MoHCC).

Table 4 shows the prevalence of conditions within each of these health areas, from existing estimates from the desk review. Although national evidence was limited for adolescent age ranges for some health issues, many of the health concerns of adolescents and their parents were reflected in high prevalence. Stakeholder priority of sexual health is reflected in 16.3% prevalence of chlamydia trachomatis among 16-24 year olds (20) and 21.4% of women beginning childbearing by 17 years (15). For mouth and teeth, 61% of older adolescents experience poor oral health, and 32% experience dental caries (21). And for third priority health issue selected overall by adolescents and parents, namely mental health, 51.7% of 15-23 year olds are at risk of affective disorders (22). A combination of stakeholder priorities (Tables 2 and 3), alongside existing evidence of prevalence of health issues (Table 4), led to a proposed design of two routine health check-ups during early and late adolescence (Table 5), which was refined in the investigator workshops.

Discussion

This study has resulted in an outline design of two routine health check-ups, one during early and one late adolescence. The advantages of such check-ups were widely acknowledged by all

stakeholders, supporting literature detailing the benefits of identifying and addressing existing health issues and preventing future health issues (13).

The consolidation of the workshop and interview findings with the desk review findings, alongside considerations of cost, feasibility, and availability of referral services, led to the design of the health check-ups, discussed and refined in the investigators workshops. This included a five stage process: i) registration; ii) completion of a digital, self-completion screening questionnaire; iii) a physical examination; iv) laboratory tests; and v) finally a review and consultation with a nurse or clinician who has been trained in adolescent health counselling (Table 5). The design includes delivery of the early adolescent health check-up in schools, in the final year of primary school and the late adolescent health check-up in community spaces. For younger adolescents, delivery in schools should reach the high proportion of adolescents who are enrolled in school at this age (15), while for older adolescents, with lower school attendance, delivery in community settings would bring services to places where many adolescents already spend time and feel comfortable, alleviating their fears around confidentiality (23). The majority of study participants advised that the health check-ups should be delivered by healthcare professionals, with appropriate training, supporting existing evidence on the importance of expert, trained, and confidential providers to facilitate adolescent engagement in health services (24). To overcome barriers of low attendance seen in other routine screening programmes, wide-reaching community messaging, entertainment activities, and provision of free screening and referral services could facilitate attendance and are supported by existing recommendations (25).

While this study effectively engaged a range of stakeholders to co-design the routine health check-ups, some stakeholders mis-interpreted what was possible within the check-ups. For

example, some participants suggested that the check-ups should be delivered by researchers (they suggested the workshop facilitators, with whom they developed a close relationship during the research, Table 2), and others advocated for the delivery of comprehensive sexual and reproductive health education within the check-ups, requiring multiple sessions, which would not be feasible within a single check-up. While data on who had previously accessed routine health check-ups were disaggregated by sex, most data were not: this limits our understanding of the different priorities and preferences between male and female adolescents and parents. While this study engaged many individuals from across different stakeholder views, they were selected based on convenience sampling and may not be representative of the wider population. Ongoing engagement with stakeholders will be needed as the intervention is developed to ensure it remains acceptable to adolescents and other key groups. For translation to other countries, additional stakeholder engagement in design and analysis of local health and social burdens and implementation feasibility is necessary to tailor the intervention to local needs and resources.

This study adds to the large and increasing evidence base of the health needs of adolescents (e.g. 26, 27), and the importance of addressing adolescents' needs related to their current health, their future health and the health of future generations (28). Addressing these health needs requires committed investment (29), which, to date, has not been provided, despite being estimated to be cost-effective (13, 30). Routine preventive, screening, and treatment health check-ups are currently absent not only in Zimbabwe, but also in other low- and middle-income countries (14). In this study, through consultation with stakeholders, we have established that a routine check-up would address unmet need for healthcare among the adolescent population and is potentially acceptable.

This study has co-designed an outline design of routine health check-ups through the involvement of adolescents, parents, teachers, healthcare workers, and policy makers. However, the actual feasibility, acceptability, yield, effectiveness and cost-effectiveness of routine health check-ups has yet to be demonstrated and such evidence will be necessary to leverage investment and direct it appropriately. We propose the need for a demonstration project using an implementation science framework (31) that would test the intervention design to assess the feasibility, acceptability, yield, effectiveness, cost-effectiveness, and feasibility of scale-up. This would provide policy makers with evidence to inform their decisions on whether to implement routine health check-ups during adolescence.

Table 1. Selection of place of delivery of health check-ups in ranking exercises with adolescents

Place of delivery	Adolescents aged 10-14 years (n=48)	Adolescents aged 15-19 years (n=48)
Schools	26	14
Community spaces (e.g. community halls)	9	30
Clinic	13	3
Churches	0	1

Table 2. Selection of the cadre of person to deliver health check-ups in ranking exercises with adolescents

Person delivering the health check-up	Adolescents aged 10-14 years (n=48)	Adolescents aged 15-19 years (n=48)
Medical staff	34	44
Teachers	6	4
Researchers	6	0
Pastors	2	0

Table 3. Selection of priority content areas for routine health check-ups in ranking exercises with adolescents and parents

Rank	Health issue	Adolescents aged 10-14 years (n=48)	Parents of adolescents aged 10-14 years (n=46)	Adolescents aged 15-19 years (n=48)	Parents of adolescents aged 15-19 years (n=49)	Total (n=191)
1.	Sexual Health	23 (48%)	29 (63%)	26 (54%)	33 (67%)	111 (58%)
2.	Mouth and Teeth	26 (54%)	26 (57%)	27 (56%)	15 (31%)	94 (49%)
3.	Mental Health	17 (35%)	29 (63%)	26 (54%)	20 (41%)	92 (48%)
4.	Hearing	31 (65%)	17 (37%)	5 (10%)	7 (14%)	60 (31%)
5.	Eyesight	15 (31%)	16 (35%)	18 (38%)	8 (16%)	57 (30%)
6.	Growth and Nutrition	16 (33%)	11 (24%)	7 (15%)	14 (29%)	48 (25%)
7.	Anaemia	-	19 (41%)	13 (27%)	13 (27%)	45 (24%)
8.	Immunisation	6 (13%)	7 (15%)	6 (13%)	20 (41%)	39 (20%)
9.	Deworming	10 (21%)	-	-	15 (31%)	25 (13%)

Note: participants could vote for between one to a maximum of five priority areas
 - Represents that this option was not selected by anyone in these workshops

Table 4. Prevalence of selected health issues in Zimbabwe, based on existing estimates

Health issue	Prevalence	Age/ sex	Source of data	Population represented
Sexual and Reproductive Health				
HIV	2.9%	10-14 years, female	ZIMPHIA, 2020 (32)	Nationally representative
	2.5%	10-14 years, male	ZIMPHIA, 2020 (32)	Nationally representative
	3.8%	15-19 years, female	ZIMPHIA, 2020 (32)	Nationally representative
	2.1%	15-19 years, male	ZIMPHIA, 2020 (32)	Nationally representative
STIs (% positive tests for Chlamydia trachomatis)	16.3%	16-24 years	Martin et al., 2021 (20)	Study in Harare, Zimbabwe
STIs (% positive test for Neisseria gonorrhoea)	3.7%	16-24 years	Martin et al., 2021 (20)	Study in Harare, Zimbabwe
Pregnancy (% young women who reported that they have begun childrearing)	3.2%	15 years, female	ZDHS, 2015 (15)	Nationally representative
	21.4%	17 years, female	ZDHS, 2015 (15)	Nationally representative
	48.3%	19 years, female	ZDHS, 2015 (15)	Nationally representative
Mouth and Teeth				
Experience of poor oral health (self-report)	61%	15-19 years	Samuelsson et al., 2018 (21)	Study in Matabeleland
Dental caries	32%	15-19 years	Samuelsson et al., 2018 (21)	North, Zimbabwe
Mental Health				
At risk of affective disorder (scored $\geq 8/14$ on Shona Symptom Questionnaire)	51.7%	15-23 years	Langhaug et al., 2010 (22)	Study in three provinces in South-Eastern Zimbabwe
At risk of severe affective disorder (scored $>11/14$ on Shona Symptom Questionnaire)	23.8%	15-23 years	Langhaug et al., 2010 (22)	Study in three provinces in South-Eastern Zimbabwe
Hearing				
Hearing loss	2.4%	4-20 years	Westerberg et al., 2005 (33)	Study in Manicaland, Zimbabwe
Eyesight				
Visual impairment	0.1%	15-19 years	ZDHS, 2015 (15)	Nationally representative

Growth and Nutrition				
Underweight <18.5 BMI	12.5%	15-19 years, female	ZDHS, 2015 (15)	Nationally representative
	30.7%	15-19 years, male	ZDHS, 2015 (15)	Nationally representative
Obesity >30.0 BMI	1.8%	15-19 years, female	ZDHS, 2015 (15)	Nationally representative
	0.2%	15-19 years, male	ZDHS, 2015 (15)	Nationally representative
Anaemia				
Anaemia <12.0 g/dL	26.5%	15-19 years, female	ZDHS, 2015 (15)	Nationally representative
Anaemia <13.0 g/dL	20.4%	15-19 years, male	ZDHS, 2015 (15)	Nationally representative
Immunisation				
Children received childhood vaccinations	76%	12-23 months	ZDHS, 2015 (15)	Nationally representative
Deworming				
Schistosomiasis	22.7%	10-15 years	Midzi et al., 2014 (34)	Nationally representative
Combined soil transmitted helminthiasis	5.5%	10-15 years	Midzi et al., 2014 (34)	Nationally representative
Substance use				
Tobacco use (in past month)	11.2%	13-15 years	Peltzer, 2009 (35)	Study in Harare, Bulawayo and Manicaland, Zimbabwe
Risky drinking (two or more a day for 20+ days)	7.0%	13-15 years	Peltzer, 2009 (35)	
Illicit drug use (three or more times ever)	6.4%	13-15 years	Peltzer, 2009 (35)	

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Table 5. Proposed design of the routine adolescent health check ups

Stage of check-up process	Details at each stage	Staff implementing each stage
1) Registration	During registration, a youth worker would welcome adolescents, and register their name, gender and date of birth.	Youth worker
2) Screening Questionnaire	The adolescent client would then be given a self-completion questionnaire on a tablet computer, with 7 sections, including psychosocial issues, mental health, substance use, sexual activity, male circumcision, adolescent immunisation history, and general health questions. The youth worker would assist with any technological challenges or questions during completion of the questionnaire.	Youth worker
3) Physical Examination	The physical examination would include: <ul style="list-style-type: none">a. oral health, with visual inspection for dental caries, pits or fissures in the enamel, abscesses, swelling or oral lesions;b. physical impairment testing to examine walking, and arm function;c. measurement of weight and height to calculate body mass index;d. testing for myopia, using the portable eye examination kit (PEEK) mobile phone app;e. hearing impairment testing, using the HearScreen mobile phone app;f. blood pressure measurement, using a digital sphygmomanometer and appropriate sizes of cuff (older adolescents only).	Two trained community healthcare providers (one male and one female)
4) Laboratory Tests	The laboratory tests would include: <ul style="list-style-type: none">a. haemoglobin measurement;b. STI testing for the older adolescents only including testing for <i>Neisseria gonorrhoeae</i> and <i>Chlamydia Trachomatis</i> (for males and females using urine or self-administered vaginal swab) and <i>Trichomonas vaginalis</i> (females only, using a self-administered vaginal swab);c. HIV testing with either provider-delivered blood-based testing or self-administered HIV oral mucosal test (with serological confirmation of reactive results)	Laboratory technician

5) Clinical Consultation	Lastly the clinical assessment would review the results of the screening questionnaire, clinical examination findings, and laboratory tests, clinically explore any issues these raise or that the adolescent is concerned about, and provide on-the-spot treatment and care, or referral as needed. Provision of information on prevention and self-management of health issues would be included where appropriate.	Nurse or clinician
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