Development of mass media resources to improve the ability of parents of primary school children in Uganda to assess the trustworthiness of claims about the benefits and harms of treatments

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Date  February 2018
Abstract

**Background:** Claims about what we need to do to stay healthy or to improve our health are everywhere. While some are trustworthy, many are not. Inability to tell trustworthy and untrustworthy information apart can result in inappropriate health choices. Unfortunately, there are few evaluated resources for helping the public to critically assess health information and make informed choices.

**Objectives:** Our objective was to design mass media resources to enable the public to assess the trustworthiness of claims about the effects (benefits and harms) of treatments, and make appropriate health choices.

**Methods:** We employed a user-centred approach to designing the IHC primary school resources. This entailed multiple iterative cycles of development (idea generation, prototyping, testing, analysis and refinement) and close collaboration with teachers and children throughout this process. We prototyped, piloted, and user-tested resources in Uganda, Kenya, Rwanda, and Norway.

**Results:** Together with media practitioners we generated over 160 ideas, with suggestions for resources for radio than for other media. After prototyping some ideas, we found that a podcast produced by health researchers and journalists working together was the most promising approach. We developed eight episodes of the Informed Health Choices podcast for helping parents to think critically about the trustworthiness of claims about treatment effects. Participants who user-tested the early versions of the podcast found that they were too long, boring, and confusing. We addressed these problems by shortening the episodes, introducing one Key Concept per episode, and using a story-telling approach, with drama skits. Participants found the final version of the podcast to be useful, understandable, credible, and desirable.

**Conclusion:** We uncovered many problems related to producing learning resources for mass media in Uganda. Using an iterative, human-centered design approach, we overcame those problems and designed a contextually relevant podcast. We have developed a guide to help others prepare similar podcasts for other settings.
Background

We encounter claims about the effects of treatments (any action intended to improve health) all the time. This includes claims about the effects of drugs, surgery, and other types of “modern medicine”; claims about lifestyle changes, such as changes to what you eat or how you exercise; claims about herbal remedies and other types of “traditional” or “alternative medicine”; claims about public health and environmental interventions; and claims about changes in how healthcare is delivered, financed, and governed. New treatment claims are made every day in the mass media.

While some claims are trustworthy, many are not, and the trustworthiness of claims found in the mass media is often inadequately assessed [1–11]. This can affect health behaviours and healthcare use [12–14]. To make informed choices, people need to be able to assess the trustworthiness of treatment claims. Untrustworthy treatment claims and misinformed decisions about treatments result in wasted resources and unnecessary suffering. This is a universal problem, but the consequences are greater in settings where resources are scarce.

The Informed Health Choices (IHC) project was established with the aim of developing learning-resources to improve people’s ability to assess the trustworthiness of claims about treatment effects and enable them to make informed decisions about treatments [15]. Our initial focus was on low-income countries. In the first phase of this work, we developed a list of 32 Key Concepts that people need to understand in order to be able to assess treatment claims and make informed decisions [16]. The Key Concepts can help people to recognize treatment claims that have an unreliable basis, understand whether comparisons of treatments are fair and reliable, and make informed decisions about treatments. Journalists in Uganda judged the concepts to be relevant to journalists and their audiences, and possible for them to learn [17].

The IHC Key Concepts served as a framework for developing two sets of learning-resources: one for primary schools and one for the mass media in Uganda. The development of the primary school resources is described elsewhere [18] and other potential applications of the Key Concepts described in another report [19]. This article describes the development of mass media resources designed to enable people to understand and apply IHC Key Concepts, to assess
the trustworthiness of claims about treatment effects and make informed health choices.

Methods

We used a human-centred design approach to developing the mass media resources [20–23]. This approach is characterized by an iterative design cycle: idea generation, prototyping, gathering feedback, analysis and refinement. It involves close collaboration with stakeholders and end-users throughout all parts of these cycles (Figure 1).

*Figure 1. Cycle of user-centred design*

The study can be subdivided into five phases: 1) review of existing resources and prioritisation of Key Concepts, 2) idea generation and exploratory prototypes, 3) version 1 of what became the IHC podcast, 4) version 2 of the IHC podcast and 5) version 3 of the IHC podcast. Excerpts from these processes are highlighted in figure 2.
Participants

Different participants were involved at different stages; Table 1 presents a chronological summary of each phase and who participated. Throughout the project, we established and maintained contact with a national advisory panel consisting of officials from three government ministries (health, education, and one concerned with children, labour, gender and social development). We also established and maintained contact with a network of teachers, and of journalists, editors of Ugandan media enterprises, and communication specialists. Their role was to advise on strategies for successful implementation of the project.

Table 1. Overview of the methods and participants in each phase of the development process

<table>
<thead>
<tr>
<th>Method type / date</th>
<th>Participants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of existing resources</td>
<td>The research team (AA, AM, AN, AO, CG, DS, SL, SR)</td>
<td>We searched for and reviewed existing mass media resources that teach the key concepts.</td>
</tr>
<tr>
<td>Idea generation workshop (Participatory collaboration)</td>
<td>Researchers, teachers and journalists from Indonesia, Nepal, Norway, Uganda, and the United Kingdom</td>
<td>At the 3-day kick-off meeting for the project, the research team together with invited teachers and journalists (18 people) discussed which concepts to focus on and brainstormed about potential resources.</td>
</tr>
<tr>
<td>Method type / date</td>
<td>Participants</td>
<td>Description</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Prioritisation of key concepts (Participatory collaboration) August 2013</td>
<td>The journalists’ network in Uganda (25 journalists) [17]</td>
<td>At a 3-day workshop, the journalists assessed the relevance of a list of 32 Key Concepts to journalists and their audiences.</td>
</tr>
<tr>
<td>Prototyping workshop (Facilitation &amp; non-participatory observation) September 2013</td>
<td>The journalists’ network in Uganda (25 journalists)</td>
<td>This was a full-day workshop at which journalists brainstormed and created prototypes.</td>
</tr>
<tr>
<td>Idea generation meetings and prototyping (Participatory collaboration) October 2013 to October 2014</td>
<td>The research team (AA, AM, AN, AO, CG, DS, LN, MK, MO, NS, SL, SR)</td>
<td>We had a series of meetings during which we brainstormed. One idea was a service that would provide structured press releases, including application of the Key Concepts to a treatment claim. We prototyped one press release. Another was a wire service that would produce short stories that would explain Key Concepts to readers and listeners in the context of news about a specific treatment claim. We prototyped two examples of stories produced by such a news service; one as a print story and one as a radio program.</td>
</tr>
<tr>
<td>Focus group feedback (Focus group discussion and semi-structured interviews) October 2014</td>
<td>Four media editors, a journalist and a health communication specialist. Four random members of the public</td>
<td>Structured press releases: The participants read the press release, and then provided feedback.</td>
</tr>
<tr>
<td>Focus group feedback (Focus group discussion and semi-structured interviews) October 2014</td>
<td>Four media editors, a journalist, and a communication specialist. Four random members of the nonacademic public.</td>
<td>News service: The participants read or listened to each of the stories and then provided feedback. Following this, we interviewed three of the participants of the focus group discussion and each of the four members of the public.</td>
</tr>
<tr>
<td>Semi-structured interviews October 2014</td>
<td>Four members of the general nonacademic public</td>
<td>The participants listened to and read the prototypes of the messages and provided feedback about the news service. Any problems identified were noted and followed up.</td>
</tr>
<tr>
<td>Analysis of findings and idea generation October 2014</td>
<td>The research team (AA, AM, AN, AO, CG, DS, LN, MK, MO, NS, SL, SR)</td>
<td>We reviewed the feedback on the news service prototype and generated ideas to address the problems that we identified.</td>
</tr>
</tbody>
</table>

**VERSION 1. THE HEALTH CHOICES (RADIO) PROGRAM (V1)**

<table>
<thead>
<tr>
<th>V1 Development of a prototype October 2014 to April 2015</th>
<th>The research team (AA, AM, AN, AO, CG, DS, MO, SL, SR)</th>
<th>We outlined plans for a series of what we initially thought of as a radio program and prepared a prototypes of two versions of the first episode; one using an interview format and one using a story format.</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1 User-testing in Uganda (Semi-structured interviews) April 2015</td>
<td>Two health journalists and four other members of the nonacademic public</td>
<td>Two versions of prototype 1 were tested in sequence. First the participants listened to the first version of the prototype (1a) and provided early feedback. We then user-tested an alternative prototype (1b) of the same contents as the first with a story-based theme. Prototype 1b was partly based on early feedback from the testing of prototype 1a.</td>
</tr>
<tr>
<td>V1 Analysis and idea generation for V2 May 2015</td>
<td>The research team (AA, AM, AO, CG, DS, MK, MO, NS, SL, SR)</td>
<td>We analysed the feedback and discussed findings from the user-testing and feedback on the first version of the IHC podcast and generated ideas to address the problems that were identified.</td>
</tr>
</tbody>
</table>
### VERSION 2. THE IHC PODCAST (V2)

<table>
<thead>
<tr>
<th>Method type / date</th>
<th>Participants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interviews with parents to identify relevant claims (Semi-structured interviews) March-April 2015</td>
<td>30 parents</td>
<td>We interviewed parents to identify health conditions and treatments that were relevant to them.</td>
</tr>
<tr>
<td>V2 Development of the second complete prototype June to August 2015</td>
<td>The research team (AA, AM, AN, AO, CG, DS, MK, MO, NS, SL, SR)</td>
<td>We prepared a series of nine episodes targeted at the parents of primary school children in Uganda. MO prepared a script for each episode, which was edited by DS and AO, and other team members provided feedback. A professional radio producer and actors produced the episodes.</td>
</tr>
<tr>
<td>V2 User-testing and piloting in Uganda (Semi-structured interviews) September to December 2015</td>
<td>28 parents and 7 research assistants</td>
<td>28 parents listened to the podcast. We interviewed them after they listened to each episode. With the help of the parents and research assistants, we also piloted a method for delivering the podcast to the parents in areas where they live and work, collecting feedback on the method and technologies used.</td>
</tr>
<tr>
<td>V2 Analysis and idea generation for V3 December 2015 to January 2016</td>
<td>The research team (AA, AM, AN, AO, CG, DS, LN, MK, MM, MO, NS, SL, SR)</td>
<td>We entered the findings into a Google spreadsheet. For each finding, AN, AO, DS, MM, MO, and SR coded its importance (very important, important, or less important); whether it was a problem, an idea, or positive feedback; and whether it applied to the entire podcast, a specific episode, or was a repeat of a previous finding. The findings were summarized for the research team and the major findings and plans for the third version, and the community trial were discussed and agreed.</td>
</tr>
</tbody>
</table>

### VERSION 3. THE FINAL IHC PODCAST (V3)

<table>
<thead>
<tr>
<th>Method type / date</th>
<th>Participants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V3 Development of the final podcast January to March 2016</td>
<td>The research team (AA, AM, AN, AO, CG, DS, LN, MK, MM, MO, NS, SL, SR)</td>
<td>MO prepared new scripts, which were edited by DS and AO. Other team members provided feedback. DS translated scripts to Luganda. DS, AN, AO prepared the lyrics to the theme song. Other members provided feedback. A professional musician was commissioned to edit the lyrics and produce the song. A professional radio producer and actors produced the episodes. DS, AN, AO and MO reviewed the produced episodes and suggested edits to the production.</td>
</tr>
</tbody>
</table>

In an early phase of the project, our primary participants were ‘mass media intermediaries’ - journalists and editorial news teams. Aiming to reach a broader public through intermediaries, we explored ideas about resources we might develop to support their work so they could report health stories about treatment claims more critically and informatively. We established a network of 25 Ugandan journalists with interest and experience in health reporting, to generate ideas and provide feedback on prototypes. These were conveniently selected based on their availability and interest in health reporting and in the project. We also recruited a group of editors from Ugandan media houses, based on rec-
ommendations from the journalists in our network and others working in mass media organisations.

In subsequent phases, for reasons described in the results section, our focus shifted to creating resources that would target mass media audiences directly instead of through intermediaries. In order to narrow our focus further, and to complement the set of learning-resources we were developing for children in primary schools, we defined our target audience as the parents of primary school children in Uganda. We recruited parents with children in year-five of primary school who, like the journalist network, participated by generating ideas and providing feedback on prototypes and the subsequent versions of the resources.

The research team participated in idea generation, data analysis, and prototype refinement. It included researchers with backgrounds in health systems research, journalism, public health, medicine, social sciences, and information design. We engaged professional radio presenters, actors, musicians and music producers to help develop the final versions of the resources.

**Review of existing resources**

We searched for and reviewed existing mass media and other resources designed to improve public understanding of health information and their ability to assess the reliability of information about treatment claims in the mass media. We searched relevant databases for published literature and contacted researchers in relevant fields. Details of this process are described in a separate report [24].

**Idea generation**

To generate ideas for resources, we conducted brainstorming sessions both within our research team and with the journalist network. Brainstorming is a method developed to enhance the ability of teams to work in groups to solve problems creatively [25]. Both within our research team and amongst members of the journalist network, four principles that guided our brainstorming processes were:

- We encouraged novel ideas.
- The quantity of ideas initially took precedence over the quality of ideas.
- Participants were encouraged to add to or modify previous ideas proposed by others.
- No evaluation of any given idea was undertaken while the group was generating alternative ideas.
To gather ideas from journalists, we conducted a 1-day prototyping workshop with the journalist network, working with multiple small groups. We led each group through the following process:

1) creating multiple personas using a structured form, then voting on one for each group on which to focus;
2) generating multiple ideas for media channels or venues, then voting on one for each group on which to focus;
3) brainstorming about potential barriers and facilitators for the chosen persona in relation to the chosen media context;
4) generating multiple ideas about specific solutions, based on choices made in step 1 and 2, and informed by reflections from step 3, then choosing one for each group; and
5) creating a rapid prototype of the chosen idea in a format that demonstrated the idea to the rest of the groups, such as role play.

Open idea generation by nature has the potential to yield tangential and irrelevant issues. In order to focus journalists’ idea generation and increase idea relevance and precision, we used personas - brief evocative descriptions of a fictitious character that can help bring real-world considerations to design processes. The personas were descriptions of fictitious people with specified characteristics, who for this exercise represented a member of our potential target audience. The personas were used to present information and provoke thoughts based on the information describing the persona. Personas are also commonly used in human-computer interaction research to help designers understand, focus and clarify users’ goals and behavior patterns [26].

We asked journalists to create personas representing Ugandan mass media “consumers” of different educational levels based on their own knowledge of their target audiences. In addition to increasing the workshop participants’ focus we used these personas to learn, from the journalists’ perspectives, about our target audiences’ motivations, beliefs, media habits, health information needs and opportunities, prior knowledge and competing sources of information. An example of a persona is attached (Appendix 1).

In addition to ideas for resources, we collected ideas from people in our target audience about relevant treatment claims that we could use as examples when developing resources. We asked members of the journalists’ network and the user-test participants to list claims about the effects of treatments that they had heard of in the recent past.
Idea documentation and analysis

During the early exploratory phase, we created a Google spreadsheet where we entered all collected ideas. In analysing these data, we understood that not all the information gathered through idea generation would result in actual prototypes. Some would be used for learning about our target audiences’ context; preferences for media content and communication channels, how they use health information; their beliefs and motivations; and barriers. In some cases, multiple suggestions had to be combined to create or support an idea for exploration. Therefore, we took care to identify information that was in and of itself an idea, that was in support of an idea; that was about channels through which a product from an idea could be delivered to the audience; that was about methods for implementing an idea, and that was about opportunities, barriers and facilitators for an idea. We grouped similar ideas together and removed duplicates.

We discussed and documented the pros and cons of each idea, tagging them according to their perceived value using the following categories: ideas that should be retained for further exploration, ideas that should be dropped, and ideas we were unsure about. This evaluation was informed by a list of desired attributes (see Box 1) prepared before collating ideas.

Through an iterative cycle of brainstorming, feedback from members of the research team, and discussions with stakeholders, we chose which ideas to prototype, based on how well they fit the attributes in Box 1 above. Additionally, they had to be practical and affordable to develop, given our limited budget and timeframe.

### Box 1: Attributes we determined that media resources should have to effectively meet the needs of our target audience

- **Credible**: Uses trustworthy sources that are based on or informed by research evidence
- **Understandable**: Simple to understand, clear straightforward message
- **Desirable**: Interesting, short, of good quality, memorable
- **Contextually appropriate**: Contextually, religiously and culturally sensitive
- **Feasible**: Practical to develop and implement
- **Inexpensive**: Potential to be developed and implemented with limited resources
- **Replicable**: Should be easily reproducible
- **Transferable**: Able to be used in a variety of ways, adaptable to other languages or contexts
- **Accessible**: Should be easy and free to access through existing media or channels
- **Wide coverage**: Should have the capacity to reach a large segment of the population
Prototyping

We started developing prototypes as soon as we completed the analysing ideas from stakeholders. The specific methods we used to develop the prototypes varied according to the type of idea. For example, an idea for print media would need preparing prototypes suitable for print, while those for radio would need arrangements appropriate for radio.

For all prototypes, we started the development process by writing out the idea in as much detail as possible including its description, the rationale, possible ways of implementing it, procedures or guidelines for developing the prototype and the resources we would need. Members of our research team and journalists in our network reviewed these descriptions before developing prototypes. We then used the descriptions to prepare prototypes. For example, for ideas about print-based news stories we wrote news stories based on claims about treatment effects in the media; and for ideas about radio programs, we produced radio programs. These prototypes were then presented to people in the target audience, journalists, and members of our research team for user-testing and feedback.

Working with information designers and journalists, we converted the written description of the ideas into actual products. For example, for ideas about print-based news stories we wrote actual news stories based on claims about treatment effects in the media while for ideas of radio programs we produced and recorded a version of a radio programme. These prototypes were then shared with potential users, journalists and members of our research team for user-testing and feedback.

Feedback and user testing

We solicited feedback about early prototypes in focus group discussions and interviews. For instance, to collect feedback about a news service idea, we presented an example of a news story that might come from such a service to a group that included editors, a journalist and a communication specialist. We used prompts to elicit discussion and feedback about the specific example, as well as the news service concept itself, and took notes. In addition to the focus group discussion, we interviewed individual participants using a semi-structured interview form, recorded the interviews, and took notes.

In the later phases when we had created prototypes of the podcast, we carried out user testing with people in our target audience. User testing is a process of formative evaluation of a product or service that involves observing a person using a product or service and obtaining feedback during or shortly after they interact with it [20,21]. User-testing enables the designer to know how their
product or service might be received by the intended user, and provides an early mechanism for providing feedback on the design, which can be incorporated into the final product. It is often means directly observing user behaviour (such as watching someone visit a website or use a mobile phone) and encouraging the participant to think aloud simultaneously (“concurrent think-aloud” technique). However, neither of these methods are suited to exploring users’ experiences of listening to an audio recording, because there are no explicit external behavioural cues to observe (like clicking on a link) and because the concurrent think-aloud technique would be disruptive. Instead we allowed participants to listen to a full recording and asked them questions about it immediately afterwards. However, we observed and marked sections where a participant gestured or their facial expression changed in the process of listening. During interviews, we asked them what they thought about the specific parts where they made the gestures and whether the gesture was in response to the part in the episode or unrelated.

Each user-test lasted from 45 minutes to an hour, including up to 15 minutes for interacting with the prototype and another 30 minutes to provide feedback. We used semi-structured interview guides to explore specific issues in more depth, based on Rosenbaum’s modification of Moville’s honeycomb framework for user experiences [20]:

- **Usefulness**: Does this product have practical value for this user?
- **Usability**: How easy and satisfying is this product to use?
- **Understandability**: Does the user recognize what the product is and do they understand the content? (their subjective experience of understanding)
- **Credibility**: Is this information trustworthy?
- **Desirability**: Is this product something the user wants? Has a positive emotional response to?
- **Identification**: Does the user feel the product is for “someone like me” or is it alienating/foreign-feeling? (e.g. is it age, gender, culture–appropriate?)

We took notes at every interview and focus group discussion. We also obtained feedback from our journalists’ network multiple times during the study. Additionally, all members of the research team provided feedback on the ideas that were generated and on the prototypes that we developed throughout the project.
**Analysis and prototype revisions**

We discussed notes regarding early prototypes from interviews and focus groups in weekly team meetings. We entered the feedback from user-test participants and from members of the research team into Google spreadsheets. For the last three phases of the study, at least two researchers from the IHC team independently coded each observation for each version of the IHC podcast based on the importance of the finding (Table 2) and its implications for changes to the podcast. The coding was combined in a single spreadsheet, discussed by the coders, reaching consensus. Based on these findings, we generated a list of problems and suggestions for changes. We discussed major problems and brainstormed solutions with the rest of the IHC team. After agreeing on the changes that we would make, we created new prototypes to be user-tested and the design cycle continued until we had addressed all of the highly important problems that we identified, and we had a product that users experienced positively.

**Table 2. Coding of the importance of feedback for the users’ experience**

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly important problem</td>
<td>A problem with the resources that must probably be addressed for the resources to be effective.</td>
</tr>
<tr>
<td>Important problem</td>
<td>A problem with the resources that should probably be addressed for part of the resources to be effective.</td>
</tr>
<tr>
<td>Problem</td>
<td>A superficial problem with the resources.</td>
</tr>
<tr>
<td>Highly important positive feedback</td>
<td>Positive response that probably should inspire in changes to the resources.</td>
</tr>
<tr>
<td>Important positive feedback</td>
<td>Praise that maybe should inspire changes to the resources.</td>
</tr>
<tr>
<td>Positive feedback</td>
<td>Praise that validates the resources as they are.</td>
</tr>
<tr>
<td>Highly important idea</td>
<td>An idea that probably should inspire changes to the resources</td>
</tr>
<tr>
<td>Important idea</td>
<td>An idea that maybe should inspire changes to the resources</td>
</tr>
<tr>
<td>Idea</td>
<td>An idea that probably should not inspire changes to the resources.</td>
</tr>
</tbody>
</table>

**Pilot testing**

During the development of the second version of the IHC podcast, we discussed methods for delivering the podcast to our target audience. The feasibility of these methods was assessed in a pilot exercise using the completed episodes of version 2. The experiences of research assistants and parents were captured using a semi-structured interview form. Findings from this process generated information about the practical requirements for conducting a community-based randomised trial evaluating the effect of the podcast [27,28], and informed our next steps in the development and delivery of version 3 of the IHC podcast.
Results

Idea generation and exploratory prototypes

We initially intended to develop tools for journalists to help them write articles and produce media programs that would enable the public to think more critically and acquire skills to assess the trustworthiness of claims about the effects of treatments. Through brainstorming sessions with the research team and with journalists we generated many ideas for doing this. These included:

- Practical resources, such as structures for reporting claims about treatment effects, visual aids that could be used to present and explain research evidence, glossaries of health research terms and plain language tools
- Training modules for journalists and journalism students in reporting health research and critically assessing and reporting claims about the effects of treatments
- A journalist network and a researcher network to support journalists in reporting claims about treatment effects

Tools such as these might help to address some barriers to improving reports of treatment claims [29], such as difficulties making research jargon understandable and access to reliable sources of evidence. However, we decided against these ideas because they would not address important underlying barriers that make it difficult for journalists to report more informatively such as commercialism in the media (the need for journalists to sell stories, which can conflict with providing balanced information) and organisational constraints (such as editors that can be an obstacle to preparing more informative reporting of treatment claims). In addition, we thought that - to the extent that we could develop effective tools for journalists - it was unlikely that they would be widely used outside of a small subset of health journalists, further limiting their impact.

Input from the journalist network provided further support for the conclusion that developing tools for journalists would have little if any impact in Uganda. We noted that most journalists in Uganda work freelance and only a handful are employed by the major news organisations with sizeable audiences. For reporters working in the media houses, there is often no specific area of specialisation and the editor or manager can assign anyone to cover stories on other issues that are not related to health. Indeed, we were only able to identify a small
number of health journalists from Uganda’s Journalist Associations’ membership lists. Additionally, journalists in the network often retorted that it was not their responsibility to appraise evidence on behalf of the public and stated quite often that their duty was “only to report as seen.” They also did not have much faith in the public being able to assess the trustworthiness of claims about treatments by themselves and thought that it was the job of health professionals to help the public learn such skills. This, we thought, would make it difficult for them to write stories in a manner that enables their audiences to assess treatment claims on their own. Lastly, we observed that there wasn’t much flexibility within the media organisations to explore new ways of delivering information to enable the public to assess the trustworthiness of claims about the effects of treatments.

In the prototyping workshop, the journalists worked in six small groups of four members. In addition to the valuable information pertaining to developing tools for supporting journalists, the journalist network produced more than 160 suggestions for how to improve the public’s ability to assess the trustworthiness of treatment claims through mass media. These were based on their chosen persona (see Appendix 1 for example). The most common suggestions were for communication channels through which we could reach our target audience. These included radio, television, newspapers, Internet, billboards and posters, person-to-person communication, cell phone service, and community gatherings.

In the workshop, following the generation of ideas, each of the six groups proceeded to develop a rapid prototype of one idea, based on their chosen persona (see Appendix 1) and a chosen media communication channel. For each prototype developed we asked participants to generate a list of potential barriers and facilitators associated with it. Overall, there was a consensus that radio was the best way to reach the broadest audience in Uganda. Five groups elected to produce prototypes for radio and one group produced a prototype for community meetings. Most of the prototypes were of a live radio talk show, involving health experts as panellists and journalists as moderators. This format is very popular on Ugandan radio stations). One group prepared a prototype integrating health messages in a primetime news bulletin. The prototype for community meetings was a health communication drama skit. Several of the radio-based prototypes included a jingle or music.

Reasons journalists gave for focusing on radio included radio being 1) easily accessible to a large section of the public, 2) free to access, 3) entertaining, and 4) flexible in terms of using local languages. However, the journalists also identified many barriers to radio-based strategies. Among these were 1) getting the audiences to tune in to a show at a consistent time, 2) inability to pause or replay, 3) unstable access to electricity, and 4) the large number of competing
programs. Furthermore, they stated that because many different languages are spoken in Uganda, programs would only reach limited audiences, unless they were produced in multiple languages. They also mentioned that information presented as health news can be boring compared to that presented in more entertaining ways. Additionally, they thought it would be very challenging to get the right people to answer questions as experts on live radio talk shows as health workers are usually very busy. Journalists also mentioned that any messages sent through radio would be treated as “adverts” that should be paid for.

Thus, although radio appeared to be the most promising and most desirable communication channel, journalists identified many barriers that would hinder its effectiveness or that would make it impractical. In addition, although groups favoured a radio talk show format with invited guests, this would potentially be difficult to implement on a broad scale due to its dependence on a regular skilled moderator and highly knowledgeable guests. We also felt that there was potential for the learning component to be undermined if the program was perceived as one where participants simply exchanged opposing opinions about the trustworthiness of treatment claims, or if it relied too heavily on the opinions of an “expert” as opposed to research evidence and application of the IHC Key Concepts. Lastly, ensuring consistency, replicability and transferability of information about assessing claims, conveyed through live radio talk shows would be potentially difficult. This led us to consider and prototype strategies that would be less dependent on journalists, moderators and on specific programs.

As we shifted focus from developing resources for supporting media intermediaries and those based on live radio talk shows, our research team explored other ideas for collaboration with journalists to jointly produce and publish content, and ideas for publishing content directly in the media. We hypothesised that these would be inexpensive, replicable, transferable and widely sharable, and that with the right mix of content and delivery methods it was possible to make them desirable, contextually appropriate, understandable and accessible. Based on these arguments, and the findings and ideas from the journalist network reported above, we proceeded to develop the first two prototypes: a rapid response service to meet the public’s needs for information about assessing the trustworthiness of claims about the effects of treatments, and a news wire service to produce short stories for publication in the media, regarding treatment claims. As we worked on the prototypes, we continued engaging the journalist network in developing other ideas for prototypes.

*Structured press releases about treatment claims*

The first idea we prototyped was ‘structured press releases’. Our research team developed this idea, informed by our experiences implementing a rapid re-

17  IHC podcast development
response service for answering policymakers’ urgent needs for reliable evidence [30]. The idea evolved partly in response to the perceived difficulties at the time, associated with developing resources for live radio. It involved preparing contextually appropriate structured press releases [31] in multiple languages, in response to a claim in the media about the effects of a treatment, new research results, or the public’s need for information. The press release would explain why the claim was trustworthy or not, and provide information about how to apply one or more of the IHC Key Concepts to assess the trustworthiness of the claim.

The press releases would be accompanied by packages of materials, also in multiple languages, to provide more detailed explanations and define unfamiliar terms. We would provide links to other resources with contextualized scientific evidence, and links to resources that media practitioners and the public could use to learn more about assessing the trustworthiness of treatment claims. We hoped that this would stimulate readers to think critically about related claims about the effects of treatments and help them make more informed health choices.

All versions would be produced in at least two of the most widely spoken languages in Uganda (Luganda and English). The press release would be formatted as questions and answers regarding aspects of a reported story that are important for people to understand for them to be able to assess claims about the effects of treatments. The structure included:

- A title, based on the original publication title of the claim in the media
- Sources of the claim about treatments (who said what, where, when? A link to the source)
- Brief heading introducing the claim and to hook the potential reader (“the hook”)
- Outline of the most important issues surrounding the claim
- Why it is important to discuss the claim in our context
- Detailed explanation of the findings from literature relevant to the claim
- Highlights of any issues relating to the local applicability of the findings both from the source of the claim and the evidence used to resolve the claim.
- Guidance on the interpretation of the evidence, in the local context
- Information about how the evidence was gathered and evaluated
- Links to relevant examples explaining the IHC Key Concept applied to the claim and to plain language definitions of terms used in the literature

We have provided a more detailed description of the idea, rationale for the approach, the principles behind our thinking and the procedures for production in Appendix 2, as well as a prototype in Appendix 3.
We conducted a focus group discussion with journalists and editors to explore how they experienced the prototypes. Although they experienced the press releases as short, easy to read and straightforward, they had several concerns. The main concern was that journalists would likely experience the structured press releases as being critical of their reporting instead of helping to make it better. The writing style was very unfamiliar to the journalists, and the press releases were too brief and lacking information.

We dropped this idea because of our perception that it would be difficult to get stories based on the press releases published.

**The “Be Fair and Compare” News Service**

Given the problems with structured press releases, we prototyped a service that would prepare full stories in a format that would appeal to audiences. The “Be Fair and Compare” News Service was proposed as a news wire service based at Makerere University College of Health Services, the largest and oldest medical school and health research institution in the country. The idea was to provide a high volume of brief, ready-to-use articles and audio files that the mainstream media could publish directly. The stories would be based on claims about effects of treatments deemed of interest to the public. These would be identified by scanning the media, monitoring new research, and interviewing members of the public. The public had an option of sending enquires through a short message service (SMS) and online social media platforms such as Facebook. A detailed description of the idea is attached as Appendix 4.

We developed both an audio and a print prototype. The audio prototype was developed as a short, pre-recorded audio message that included a claim about the effectiveness of Zmapp for treating Ebola virus disease. It started with a narration followed by opinions of the public about the trustworthiness of the claim before they listened to any explanations. This was followed by an explanation of why the claim was untrustworthy, applying an IHC Key Concept, and explaining the concept using relevant analogous illustrations. It concluded with opinions of the same people after they had listened to the explanation, and a take home message. At the time, Zmapp was still an investigational drug early in development. Claims that it was effective were based on anecdotal evidence. A copy of the audio prototype can be found [here](#).

The print prototype was designed to have a catchy title, a “hook” (an engaging introduction) to get people interested in reading the story, the claim and important issues to consider when assessing the reliability of the claim. The claim used in the prototype was based on an article that appeared in a local newspa-
per stating that a drug called “Canova” was effective in ameliorating the effects of HIV [32]. A copy of the print prototype can be found in Appendix 5.

We organized a focus group discussion with four editors of major news organizations in Uganda, one journalist, and one health communication specialist to explore how they experienced the prototype and the proposed news service. They listened to the audio prototype and read the print prototype before we started the discussion. In addition, we carried out individual face-to-face interviews with “lay” members of public to explore how they experienced the prototypes. The “lay people” represented our target audience.

All the participants in the focus group were positive and expressed interest in the general idea due to, in their own words, the need for “evidence-based healthcare”, “improving science writing”, “simplification of health research” and “dispelling misinformation about treatments.” However, the idea of enabling their audiences to assess the trustworthiness of media content was a totally new concept to the editors. They wanted to provide their audiences with clear messages and definitive answers regarding the reliability of the treatment claim. As one editor put it: “Experts should be available to provide precise answers.” They also were concerned about stories not vetted by them. They believed that their role as gatekeepers was important, and they were sceptical about the idea of improving their audiences’ ability to vet information (or claims about treatments) themselves.

Most of the positive feedback was about the style of presenting information. Participants liked the beginning of the audio prototype which had voices of people on the street being asked about their opinions regarding the claim. They liked our approach of explaining complex health information using analogous illustrations, and they thought that this was clearer in the audio prototype than the print prototype.

However, some editors had the impression that we were the ones making the claim about Canova while others thought that we left the audience with the impression that Canova is effective as stated in the claim. Some thought the aim of the project was to provide research results. Several wanted information that we thought was irrelevant to addressing claims, such as how drugs are approved or how they work.

Participants thought that the stories did not have adequate details about the source of the claim, the claim itself, the assessment of the claim or some of the information we used in the explanations. “Unfamiliar terms were not explained e.g. experimental drugs, Zmapp” (Lay participant 1); “The message seems incomplete, hanging – should inform people about what they should do. It is not enough to just tell people to compare and be fair or send SMS [short message service] text.”
There should be a conclusion about how to interpret the information in the claim” (Lay participant 2). The editors suggested that feature articles would work better than short articles. One editor suggested that we consider using pull-out supplements inserted in newspapers.

The focus group thought that there were too many documents in the “Be Fair and Compare News Service operating procedures and Resources” folder (templates and guidelines), which we showed them. They thought there was too much information in those documents to write hard news stories without missing information or compromising the newsworthiness and entertainment value of the story. They felt it was not obvious which document to use and when. It was also confusing that some documents applied to only some stories e.g. the “SUPPORT summary checklist” [33] which we had developed for use if the claim based on findings of a systematic review of the effects of a treatment.

The editors believed that the public might not be able to access sources of information through the links we included. They mentioned that, “Social media platforms are for the elite.” However, some thought SMS messaging was growing rapidly and could be a valuable communication modality as part of the project. They said they would not publish any reports or links in news stories prepared by our project as such material would be considered commercial, or any public service announcement, as it was their expectation that those should be paid for. Furthermore, they said that all our stories would be subjected to editorial review, and that they would be unlikely to publish them without first revising them, if they published them at all.

The four members of the non-academic public (representatives of our target audience) also generally found the prototypes confusing and they said they would find it hard to use Social media and SMS, because there are costs involved. With Social media one would need a smart phone, which is very costly and SMS also costs money. Furthermore, some said the print prototype was problematic because many people can’t read.

The following actionable findings emerged from the focus group and interviews:

*The focus should be on audio*

- Focus on audio messages through radio, because this is the most accessible means of communication.
- Make stories available for listening and download online (e.g. via Facebook, YouTube, SoundCloud, a project website or iTunes.
- Consider a series of features prepared for specific broadcasters (e.g. regional radio) rather than a news service.

*We should be more specific about the target audience*
• Target a specific target audience, because it is difficult to develop something that appeals to and can be understood by everyone.

**We should make the aim and content clearer**
• Make it clear to the audience that we are empowering people to assess claims about the effects of treatments, not simply assessing the claims for them.
• Provide a clear message regarding the trustworthiness of each claim.
• Consider using more than one example in the explanations and use claims that are of interest to the target audience.
• Repeat important information in each story.
• Consider a checklist or a list of reminders for our audience as a quick reference tool.
• Use more than one language.

**We should explore ways of improving the credibility of the project, content and sender**
• Let the audience know that there is a credible organization behind the project.
• Provide more information about the claims and their origins to avoid the audience thinking that we are making the claims.
• Ensure that the editors, producers and other “gatekeepers” understand what the project is about.

**We should explore other activities that could help improve the effectiveness and outlook of the project**
• Consider training journalists and editors and including fact-checking packages with stories.
• Promote the project and stories ahead of time in various media.

**Development of the IHC podcast**

Based on the above findings, we began to explore creating a series of pre-recorded audio messages about assessing treatment claims. We decided to develop a program that closely resembled a live interview talk show, which we hoped listeners would experience positively. We planned to work with a multidisciplinary team including journalists, professional actors, editors, health professionals, health researchers, and members of our target audience to develop ideas, write scripts, and produce a series of pre-recorded audio episodes for multiple digital media platforms. We initially planned on producing this as a radio programme, based on the advice to focus on radio from the focus group discussion with editors and journalists.
Version 1. The Health Choices radio programme

Because of the problems earlier identified with live radio we chose to produce a pre-recorded radio programme. Version 1 (The Health Choices radio program) featured a radio show host who interviewed a health researcher and a professor about two treatment claims. For each claim, people from the target audience gave their opinions before and after the trustworthiness of the claim was discussed by the three show participants.

To explain the trustworthiness of each claim, the guests (health researcher and professor) applied an IHC Key Concept to assess the claim, and used an analogy to help explain that concept. Then the best available evidence from a systematic review was presented and used to assess the trustworthiness of the claim. More information was provided about where a listener could access research evidence pertaining to similar claims. Key take-home messages were about how to assess the trustworthiness of treatment claims. We produced two prototypes, both of which can be found here. Each episode had:

1. A welcome to the program and the episode
2. References to the narrator and characters.
3. An overview of the episode
4. A skit introducing the first claim
5. Opinions from three people from the target audience about the first claim before listening to an explanation
6. Explanation of the reliability of the first claim applying an IHC Key Concept
7. A presentation of the findings of a systematic review
8. Opinions from the same three people about the claim after listening to the explanation and evidence
9. Introduction of the second claim and a repetition of steps 5 to 8
10. Conclusion of the episode

User testing of the first prototype indicated that the detailed explanations were valued, the opinions of members of the public provided authenticity to the program, and the health researcher and professor provided credibility to the program. However, we identified several problems, including:

- The first episode was too long (15 minutes) and the explanations were confusing. There was too much information packed into a single episode, which made it difficult to follow.
- Presenting two claims in one episode created confusion about the take home messages.
- The interviews were monologic with long explanations, which made them boring.
- The interviews did not sound natural.
The three members of the target audience had strong, wrong opinions about the claims, which did not change after listening to the explanations and the evidence. In addition, we observed that some of them introduced new claims about treatment effects when giving their opinions about the claims that we were discussing in the episode. These new claims became a new source of confusion in the episode.

Based on these findings, we decided to modify the format of the programme, to shorten each episode, to only include one claim in each episode, and not to include the opinions of people from the target audience but to introduce the claim and discuss it in a story. We produced a new prototype that was eight minutes, removed the long introduction, shortened the explanations and the conclusion, and only used one claim. User-testing indicated that this version was better and that the explanation using an analogy and examples was good.

However, listeners still confused the claim and the main message about applying an IHC Key Concept to assess the trustworthiness of the claim. They also still found the programme boring, and the introduction too long. We therefore decided to modify the format again and to produce a podcast series instead of a radio programme. This enabled us to more easily define and reach a target audience. It also removed the constraints of the norms and expectations of radio programs in Uganda, and other problems with radio programs mentioned earlier.

We decided to focus on parents of primary school children as our target audience. This would complement the IHC primary school resources [18], with the potential to reinforce learning of both children and their parents, and the potential to reach parents through their children’s schools [28]. The checklist could help clarify that the focus of the podcast was on the IHC Key Concepts, provide a quick reference, and help them to remember the concepts.

Having parents as our target audience enabled us to tailor the podcast to a greater extent, focusing on claims, concepts, and stories that would be relevant to this audience. We decided to limit the number of episodes for practical reasons (limited time and resources to produce and evaluate them), but also because we thought that parents might not want to listen to a large number of episodes and we did not want to overwhelm them with too much information. We therefore prioritized nine IHC Key Concepts using the following procedure: each member of our research team independently made a list of the Key Concepts they thought we should prioritise; we summarised our judgements and discussed disagreements until we arrived at a consensus (see Box 2).
Box 2. Nine Key Concepts prioritized for the Informed Health Choices Podcast

**Recognising an unreliable basis for treatment claims**
- Treatments may be harmful
- Personal experiences or anecdotes (stories) are an unreliable basis for assessing the effects of most treatments
- An ‘outcome’ may be associated with a treatment, but not caused by the treatment
- Widely used treatments or treatments that have been used for a long time are not necessarily beneficial or safe
- Opinions of experts or authorities do not alone provide a reliable basis for deciding on the benefits and harms of treatments

**Understanding whether comparisons are fair and reliable**
- Identifying effects of treatments depends on making comparisons
- Apart from the treatments being compared, the comparison groups need to be similar (i.e. 'like needs to be compared with like')
- The results of single comparisons of treatments can be misleading

**Making informed choices about treatments**
- Decisions about treatments should not be based on considering only their benefits

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**Version 2. The IHC podcast**

We created a series of eight main episodes, each including a story played out by the actors where a claim is made by a character and its trustworthiness is assessed and discussed by other characters. The setting and characters were chosen according to the claim. For example, one episode about the effects of birth control pills was situated at a village health meeting and involved a woman asking a community health worker about the trustworthiness of the claim that birth control pills cause women to gain weight. The story included an explanation by another character, the community health worker of why the claim is not trustworthy, applying an IHC Key Concept. We used an analogy to help explain the concept, and there was a conclusion with a take-home message. Each main episode of was 5-7 minutes long.

In addition, we developed an introductory episode, a one-minute recap episode for every two main episodes before the last two, and a conclusion episode including a recap of the last two main episodes, making a total of 13 episodes in English and Luganda. In the conclusion, we repeated the key messages from all the main episodes. In user testing, participants listened to the episodes one at a time in their preferred language, and they provided feedback in a language of their choice. Table 3 summarizes the contents of each episode, the rationale for the choice of claims and the Key Concepts applied in assessing the trustworthiness of the claim. The complete Version 2 of the IHC podcast can be found [here](#).
### Table 3. Claims used in main episodes of IHC Podcast versions 2 and 3

<table>
<thead>
<tr>
<th>Episode and main lesson/Key Concept</th>
<th>Claim used in the episode and issues of concern or subject for discussion</th>
<th>The issues or subject for discussion about the claim and reason for inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Episode 1</strong></td>
<td>Most treatments have both good and bad effects (benefits and harms)</td>
<td>“There are herbal medicines that cure malaria and do not have any bad effects.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The claim that herbal treatments do not have any bad effects is untrustworthy since most treatments can have both good and bad effects. How sure can one be that herbal treatments are indeed without any bad effects?</td>
</tr>
<tr>
<td><strong>Episode 2</strong></td>
<td>Knowledge about the effects of treatments requires comparisons</td>
<td>“Zmapp, a new investigational drug in evaluation can cure Ebola Virus Disease”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zmapp was an investigational drug. Evaluation of Zmapp was not yet complete at the time but it was given to some health workers who subsequently improved. Given what we knew then how sure could we be that Zmapp cures Ebola Virus Disease?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Eating quail eggs can make one very strong.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>There was no known evaluation to date comparing taking quail eggs to taking nothing or to anything else, to establish if eating the quail eggs makes one stronger. How sure can one be that eating quail eggs will make one stronger in the absence of any fair evaluation of their effects?</td>
</tr>
<tr>
<td><strong>Episode 3</strong></td>
<td>Personal experiences are not a reliable basis for claims about treatment effects</td>
<td>“Putting cooking oil on a burn will heal it since it has worked for someone else before”</td>
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<tr>
<td></td>
<td></td>
<td>The claim was based on someone’s personal experience using cooking oil on burns wounds. How reliable are personal stories (anecdotes) in determining how treatments will work?</td>
</tr>
<tr>
<td><strong>Episode 4</strong></td>
<td>An effect on an outcome may be associated with a treatment, but it may not be the treatment causing the effect to happen</td>
<td>“A lot of women gain weight when they take contraceptive pills.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This claim is based on the association between women using contraceptives and adding weight. Is it possible that an effect on an outcome could be associated with a treatment yet it is not the treatment causing effect?</td>
</tr>
<tr>
<td><strong>Episode 5</strong></td>
<td>How long a treatment has been used or how many people have used it is not a reliable basis for judging the effects of treatments.</td>
<td>“An herbal treatment called ‘kyogero’ stops babies from getting infections because many people have used it for a long time.”</td>
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<tr>
<td></td>
<td></td>
<td>This claim is based on the finding that many people have used the herbal treatment for a long time. Does the finding that many people have used a treatment for a long time mean that the treatment is effective and/or safe?</td>
</tr>
<tr>
<td><strong>Episode 6</strong></td>
<td>Opinions of experts can be misleading if they are not based on reliable evidence</td>
<td>According to one expert: “taking some hot pepper will heal stomach ulcers”.</td>
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<tr>
<td></td>
<td></td>
<td>The claim is based simply on what an expert said- an expert opinion. Is it possible that experts can be wrong in their opinions?</td>
</tr>
<tr>
<td><strong>Episode 7</strong></td>
<td>Comparisons of treatments should be fair</td>
<td>“Medical male circumcision reduces the chances of acquiring HIV.”</td>
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<tr>
<td></td>
<td></td>
<td>This claim was based on a fair comparison of medical male circumcision to prevent HIV, and no circumcision. What are fair comparisons? Do fair comparisons of treatments offer a reliable basis for determining if treatments are effective and/or safe?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Group support treatment is helpful for someone who has depression and HIV because the treatment has been compared with other alternatives and found to be effective.”</td>
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<tr>
<td></td>
<td></td>
<td>This claim was based on a fair comparison of using group support treatment and not using it for people with depression. What are fair comparisons? Do fair comparisons of treatments offer a reliable basis for determining if treatments are effective and/or safe?</td>
</tr>
<tr>
<td><strong>Episode 8</strong></td>
<td>Single comparisons of treatments or comparisons with very few people can be misleading</td>
<td>According to findings from a small study: “washing hands with soap does not stop children from getting diarrhoea”.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The claim is based on a single study with very few participants. To what extent can we rely on single studies with very few participants?</td>
</tr>
</tbody>
</table>

*Claims used in version 3 of the IHC podcast in place of the one used in version 2.

*A complete description of the IHC Key concept and their implications can be found in Austvoll-Dahlgren et. al. [16]*
More participants preferred listening to the episodes in Luganda than English. Even participants that listened in English suggested that we should have a version of the same messages in other languages. “The messages should be translated to Luganda and other vernacular languages that most people in Uganda understand” (Participant 11).

Overall, participants’ comments were positive for most of the episodes and for the series as a whole. Most participants who had listened to this and previous versions liked the new structure and flow of each episode, the introduction, the claims, the explanations, the discussions, the characters and the jingles.

“I enjoyed the fact that Mr. Sonko wants to share what he learned from the explanations. But let him say he wants to share with the community in instead of sharing with only his wife. This message is good and should not just be shared with only one person” (Participant 03, episode 6).

Most participants thought that the claims we used in the episodes were appropriate.
“The radio episode has an interesting message because it’s about malaria which affects a lot of people” (Participant 02, episode 1).

Many seemed to understand the main message and for most, claims were no longer being confused for the key messages.
“The claim used is good, very simple and very common. A lot of people have heard many claims about ulcer treatments. This was good”; “The audio clip is about how much one should trust experts. Is your trust based on research? Even though you enquire from experts about treatments you have to first find out if what they say is from scientific research” (Participant 01, episode 6).

“This is OK. The doctor tried to explain the importance of numbers in carrying out research.” (Participant 03, episode 8)
“I have learnt that medicine is not 100% perfect because it has its other effects”. (Participant 17, episode 1)
“The part I didn’t understand was why health workers used Zmapp when it was not tested.” (Participant 15, episode 2)

However, some participants still thought that the purpose of the project was to provide specific messages about what people should do to improve their health. Some wanted more general information about the health conditions we presented in the episodes while others wanted more information about the treatments we mentioned and how they work.
“The episode should talk about a disease, how it is transmitted and how it can be cured” (Participant 19); “The episode should be made clearer and, also tell us the cause of Ebola” (Participant 09); “The conclusion should at least sum up with the signs of Ebola inclusive” (Participant 18).

“The project should sensitize people more about other methods that can prevent AIDS” (Participant 21); “People should be enlightened about any other measures to HIV-AIDS prevention apart from circumcision alone” (Participant 18).

Concerning a statement about the need for fair comparisons – randomized controlled trials of treatments as the best way of evaluating the effects of treatments: some participants were still missing the main message even though it was being repeated for every episode. Others were still confused by the details of the explanations.

“The other part that confused me was the method of comparing a treatment with no treatment. I did not understand it clearly” (Participant 13, all episodes).
“I did not understand why large numbers are used to determine whether a treatment is effective;” (Participant 14, last 3 episodes)
“I did not really understand the terms association and causation;” (Participant 25, episode 4)

Some people felt that they would need a lot more time to understand the main message of some episodes. As participant 06 put it: “Understanding the message in this episode would need a very long time because it’s confusing;” (about episode 5). One person wondered how one can tell if a comparison of treatments was “big enough” (Participant 12).

Some participants felt that the two examples we used in each episode to explain the Key Concepts within each episode would have worked better if they were more closely related.

“Both examples confused me. The episode started with a claim on sleeping positions for babies and ended with use of soil for treating HIV/AIDS. There was no take home message because I saw that the two claims were not corresponding.” (Participant 19, episode 5)

“The examples are not appropriate. The example of “boda bodas (motor cycle taxis)” is not related to the one for children and diarrhea.” (Participant 21, episode 8)

Some participants mentioned that some of the examples we had used were difficult to understand and probably inappropriate for the context. The example about Zmapp, the investigational drug for treating Ebola that we used in episode
2 was noted to be unfamiliar to most participants even though it was talked about quite often in international media.

“The claim about Ebola was not well known to me and to the community where I stay.” (Participant 13, episode 2) Another commented that the example used in episode 8 was out of context: “The example given was outside the bounds of the project because it was in Congo.” (Participant 04).

In addition, many participants had very strong opinions about some of the claims and examples we used in version 2 to the extent that they became a distraction. Of particular concern was the claim used in episode 7: medical male circumcision for preventing HIV.

“The comparison was wrong. Circumcision doesn’t prevent AIDS but maybe other diseases. Circumcision does not stop one from getting AIDS.” (Participant 24)

“You should use another example. The circumcision and HIV prevention was confusing. There are many people who are circumcised who have HIV. This message will be mixed up.” (Participant 04).

Some terms used in the episode were unfamiliar and elicited a range of differing reactions. While several user test participants did not understand the acronym “ACTs” and found it confusing, some participants found the familiar examples such as Coartem® which people already knew, helpful.

“What is ACTs? This does not make the episode clear. Define ACTs in simple terms.” (Participant 04, episode 1)

“The message ACT, is a put off, it sounds like a message for doctors” (Participant 03, episode 1)

“I would not pay much attention to the episode because some of the words used like Zmapp were not familiar” (Participant 13, episode 2)

“I can’t remember the claim. It was a bit confusing. Z...something, Zmapp is confusing. Never heard of it!” (Participant 02)

We had used the term “an experience” for anecdotal evidence. Some people confused this as meaning having expertise accumulated over a period of experiential learning.

Participants were divided on the issue of length. Some participants felt that the episodes were still too long while others felt it was of the appropriate length given the needed explanations and examples.
“Reduce on the length of episodes i.e. the introduction and conclusion are too long. We can do without the introduction” (Participant 17, episode 4).
“The episode is lengthy. One can forget about the other information.” (Participant 19, episode 1)
“The clip of the episode is lengthy therefore reduce on the announcer’s time and use at least one example that can be understood easily.” (Participant 17, episode 5).

There were several comments about specific details that might improve the overall outlook of the program and users’ experience listening, for example:

“The two characters were very good, but the third character, the doctor, needed to be more serious in the episode and should articulate his words in a better way.” (Participant 09, episode 7)
Participant 21 observed that he could not differentiate the three voices of the actor in episode 8, and some mentioned that talking time was not balanced among the characters in the same episode:
“The shopkeeper at some point vanished from the discussion. He should be given more time” (Participant 02, episode 8).

Based on these findings, we clarified that the aim of the podcast was to enable people to make choices, not to tell them what to do. In the introduction episode, we used the metaphor: “Give a man a fish and you will feed him for a day. Teach a man how to fish and you will feed him for a lifetime.” We also added a short sentence to the introduction for each episode about the difference between telling them whether a claim is right or wrong and teaching them how to assess any claim. We edited the introduction to each episode to make them shorter, add variation and intonation, and note the main claim in the story.

Other changes that we made included:

- Ensuring that men and women were fairly represented in each story, and that the story and content of each episode would appeal to both men and women
- Adding more dialogue and distributing talking time more evenly across the characters
- Adding intonation where voices were experienced as flat and ensuring that actors spoke slowly enough.
- Having the characters who learn something in each episode express wanting to share it with others
- Having a theme song (in both Luganda and English)
- Replacing the claims used in some of the episodes
- Clarifying or adding relevant information about the specific claims that were used, such as adding other examples of artemisinin combination
treatment (ACT) to episode 1 and adding a message about what you should do when you get a burn to episode 3

- Improving the explanation of how and why health researchers sometimes compare using a treatment to "no treatment" or to "doing nothing"
- Improving the explanation of the concept that association is not the same as causation in episode 4
- Making specific changes to some of the episodes, such as adding restaurant background sounds to episode 3 and changing the setting of episode 4
- Adding more information to the conclusion episode, including more details from each episode
- Not using terms for the first time in the conclusion episode

**Version 3. The final IHC podcast**

In addition to the changes above, we removed the credits to partner institutions in countries other than Uganda from the introduction of each episode of version 3. We did this to avoid giving the impression that the messages were coming from a “foreign” place. This was important because some participants had expressed concern about the origin of this program and needed to be assured that we were developing a program with no foreign influence. We emphasized more clearly the difference between this program and other programs in every episode by including the statement “In many health programs people tell you what health choices to make: but in this program, we explain why some of the things people say about treatments are trustworthy and others are not. If you understand this you can choose for yourself what treatments are right for you.”

To further focus audiences’ attention and to reinforce the lessons about assessing claims in each episode we decided to add a Key Concept to the introduction of each episode: “most treatments of any type have good effects and bad effects” (most treatments have benefits and harms). Based on our observations, we thought this could help address strong preexisting beliefs, preparing the listener to pay attention to the explanation, since they may have a strong belief about the effect of the treatment, but not other potential effects. We also decided to develop a reminder checklist in two languages, which we envisioned would help parents to remember the key messages from the IHC programme.

The final set of media resources included the IHC podcast, the IHC theme song and the reminder checklist all produced in English and Luganda. The final podcast is a series of 13 audio messages covering nine Key Concepts that people need to understand and apply in order to assess the trustworthiness of claims about treatments and make informed health choices. This includes an introduc-
tory episode, 8 main episodes, 3 recap episodes, and a conclusion episode. Each main episode lasts 5-7 minutes, and each recap lasts 1-3 minutes. The theme song is in a mixture of Luganda and English and the genre is afrobeat, popular in Uganda. We incorporated parts of the song at the beginning of each episode, in the background of the introductions and conclusions, and at the end of each episode.

In addition, two other resources that are described elsewhere grew in part out of this work: a plain language Glossary of Evaluation Terms for Informed Treatment choices (GET-IT) [34], and the Critical thinking and Appraisal Resource Library (CARL), a library of resources to help people understand the IHC Key Concepts [35].

Other findings

Most of the individuals who participated in the development of these learning resources did not previously think critically about treatment claims. They frequently perceived unsubstantiated claims as valuable health advice, and sometimes acted on this advice. We also found that most people could not recognise claims in advertisements of health products or in sham health advice. Two of the commonest claims were about the strongly held belief that herbal products do not have any side effects for the simple reason that they are natural, and the claim that treatments which have been in use for a long time and are used by many people are effective or safe and do not need to have been evaluated.

“...my grandmother takes about one litre of “moringa” [Moringa oleifera] per day. But these are natural... natural treatments cannot have bad effects.”

“...but generation after generation has used “ekyogero” to prevent illnesses in babies. How can it be that its effectiveness is questionable... Look! my great grandparents used it, my grandparents used it, my parents used it, I used it...why would anyone claim that something works yet it does not? I trust it because it has been used by many people for a very long time. This practice was here long before western medicine. If it didn’t work, why would people use it for such a long time?”

When we introduced the project to journalists, and teachers [17,18,36], participants started to realise the potential value of the project and they become increasingly interested in participating as the project progressed.

“Imagine I went to this herbal clinic and they told me to take a glassful of charcoal solution every day for two years, and I had started to take it without questioning. But when you introduced this project I started asking myself, what was I thinking...charcoal for stomach ulcers!?“ said one member on our journalists’ network.
People were used to hearing adverts about health products which contained many health claims, so it was quite common for our messages to be interpreted as health adverts, and some of the initial feedback we got was based on misconceptions that we were making health adverts. To eliminate this confusion, we had to adjust the episodes so that each of them reminds people that we were developing a series of messages as part of a larger program to enable people think more critically, so that they can make their own more informed choices about treatments.

We also encountered participants who thought that the project was against herbal remedies because most of the claims that we gathered from the public were about what they had heard about herbal products and other forms of alternative medicine (probably from the large volume of TV and radio adverts). We made specific efforts to correct this misconception everywhere we presented the project, and we made sure to include claims from both “western” medicine and alternative medicine domains, and in all our explanations.

**Piloting of methods for delivering the podcast to parents**

With the help of research assistants and members of our target audience we explored the feasibility of a method for delivering the podcast to parents, using small portable media players. In this low-income context where, there is limited internet access and few people have smart phones, we found that preloading the audio messages onto small inexpensive portable media players and handing these to the parents was an acceptable and feasible way to deliver the IHC podcast.

This method also enabled us to circumvent additional problems with radio that are described above. The parents were pleased that they had the opportunity and sufficient time to replay the episodes any time they wished and that the messages on the devices could be shared with others conveniently.
Discussion

The aim of this work was to develop mass media resources to enable people to think critically about the trustworthiness of claims about the effects of treatments. We sought to create a useful, usable, desirable, credible, contextually appropriate, accessible, and understandable intervention. In addition, we aimed for it to be inexpensive, easily replicable, and transferable to other contexts. We discuss our findings in relation to each of the facets of the honeycomb framework of user-experience [20], focusing on lessons that might be relevant to other researchers working in this and related fields.

We used a human-centred design approach [21]. Using this approach means that the precise description of what we would make was not determined beforehand - the designed output a result. We were able to place user and stakeholder concerns at the center of our development in part because our funding application and project protocol only specified our goals and methods to reach those goals, not a pre-determined description of what we were going to make. This gave us the flexibility necessary to adapt our ideas to the feedback we received underway. However, we had the IHC Key Concepts [16] as a starting point, and the development of these resources was informed by reviewing what others have done [24,35], as well as by our findings from brainstorming, prototyping, and user-testing. Working with a multidisciplinary team composed of journalists, information designers and health researchers was instrumental in enabling us to achieve our objectives.

Over a three-and-a-half-year period, we explored many ideas, and prototyped and tested several of them. We rejected most of the ideas generated early in the project because they did not satisfy the criteria in Box 1. For example, there were many suggestions for a television program, but this idea would not have been feasible to develop or implement with our limited resources; its’ coverage would be limited to those with access, and it would be difficult to replicate. We prototyped resources for print media, but they were abandoned based on editors’ and journalists’ feedback, which indicated they would not be used. Using an iterative approach, informed by extensive feedback from end users, was essential [28].
We focused on reaching the public directly, rather than through journalists and editors, and narrowing our target audience to parents of primary school children.

**Usefulness**

We found increasing appreciation of the usefulness of this work as participants began to understand how much of the “health advice” to which they were exposed was in fact unsubstantiated claims about what they should do to maintain or improve their health. We were told repeatedly by some editors that if someone can pay for the media space, it does not matter what they have to say as long as it is not politically or socio-culturally “offensive” or destructive to their media enterprise. “It is not our duty to check the trustworthiness of the messages in advertisements.” Most of the people with whom we interacted mistakenly assumed that the government reviewed and approved all health-related content in the media, but this is not always the case. People and companies continue to make unsubstantiated claims about the effects of treatments in the mainstream media and across social media platforms. Overall, the IHC podcast was seen as a useful tool that could help empower people to question more and assess statements made about the effects of treatments, both in the mass media and elsewhere.

**Usability and understandability**

In the early stages of development, we encountered many usability challenges. For example, the print version of the structured press releases lacked important content and the writing style was not acceptable to media houses. The audio version had confusing content, difficult medical terminology, insufficient explanations, and a host of production glitches.

People often did not understand the main purpose of the project, and this in turn led to misunderstandings about the content, such as thinking we were going to provide them with health advice. There may be several reasons for this. One is that a lot of people do not routinely question the trustworthiness of treatment claims. When they do, they frequently consider who is making the claim, rather than the basis of the claim. Although fact-checking is common, fact-checking claims about treatment effects is uncommon and is seldom done in a systematic way in the mass media [1,5,7–11] Moreover, it is unclear to what extent systematic fact-checking of treatment claims is done in low income countries. People also question the ability of journalists and non-academic members of the public to assess the trustworthiness of treatment claims and assume that this is something that requires professional training. We worked with our audiences to adjust each episode and the approach to the podcast as a whole until they were satisfied that the content was understandable and the podcast was usable. We reminded participants in each episode that the purpose of the pod-
cast was to enable people to assess claims as opposed to assessing claims for them.

**Credibility**

A few participants in the user-testing questioned who was funding this work and who our partners were. Otherwise, we did not find creditability to be a major problem. This may be, in part, because the project was based at Makerere University, which is well known in Uganda. Some journalists, however, did question the source of funding for the project. Concern about funders pushing specific agendas is common in Uganda. We were open about funding sources and the roles of the funders in the project, which helped reassure the journalists. However, we removed credits to non-Ugandan partners in the audio recording so that it would not interfere with the credibility. This information was available for anyone who visited the web site for more details.

**Desirability**

Early users (journalists and editors) did not experience most of our initial ideas as desirable (i.e. the structured press releases, the “Be Fair and Compare” news service, and the first version of the Health Choices programme, largely because they perceived these ideas as unfamiliar. We abandoned several ideas for this reason.

We changed to a story-telling approach to introduce the claims and explain their trustworthiness in version 2 of the IHC podcast, because people tend to make sense of their lives through stories they hear in the contexts with which they are familiar. A systematic review of the effect of changing health-promoting behaviours through narrative interventions supports the use of a narrative approach [37]. Characters in the narrative can model new behaviours and enhance self-efficacy [38]. Some participants demonstrated the desirability of the podcast by asking if they could have all the episodes so they could listen to them at once or listen more in their own time. A health communication NGO and producers at the Uganda Broadcasting Corporation expressed interest in airing the podcast on radio as part of their health communication programming.

**Identification**

Recording in Luganda was likely the most important strategy we employed to create a product that did not feel foreign to participants, most of whom had Luganda as their first language and were not fluent in English. We also used terminology, examples, stories, and music that were appropriate for our target audience. With the earlier versions of the media resources, participants said we used unfamiliar language, which appeared to reduce their motivation to engage with the content. In one episode, we used a claim that we mentioned was based on
research done in the Democratic Republic of Congo. The claim was about the effects of handwashing with soap on reducing diarrhoea. Whereas handwashing is a hygienic practice applicable to Uganda and the whole world, some users experienced the use of an example of a study from Congo as foreign. We also used a claim about Zmapp, which was used to treat American aid workers during the Ebola crisis in western Africa. Again, in addition to Zmapp being a difficult word, the story of Ebola in West Africa was not something they could easily identify with. We initially used jazz music, which people said was music for the “elite”. We later changed to afrobeat, a music genre most Ugandans listen to.

**Strengths and limitations**

We used a human-centred approach, which engages end-users in the design process. Experiences from elsewhere confirm that this approach can help to ensure that an intervention is relevant and acceptable [39]. As a result, we were able to design an educational podcast that listeners experienced as useful, understandable, credible, desirable, and appropriate. This, in turn, helped to ensure that our intervention was effective [28]. To our knowledge, the effectiveness of other podcasts for non-formal education or health education have not been evaluated in randomized trials [40–45], and we are unaware of other work describing the use of a similar process to design a mass media intervention to enable people to think more critically about treatment claims.

Because we tailored the podcast to our target audience, it is less likely it will feel familiar to people in other countries. Therefore, the IHC podcast that we developed is unlikely to be transferable to many other contexts. However, others can use the same approach to create a podcast tailored to their target audience, using a guide we have prepared for this purpose [46]
Conclusions

We have developed an educational podcast to help parents assess the trustworthiness of claims about the effects of treatments; which listeners experienced as useful, understandable, credible, desirable, and contextually appropriate. During the design process, we encountered many problems with the early prototypes. We were able to address those problems by working directly with end users through an iterative, human-centered design approach. Employing this method ensured that the podcast was effective in enabling parents to assess treatment claims [28]. Having learned from these experiences we have developed a guide to help other researchers interested in developing similar podcasts [46].
**Abbreviations**

IHC – Informed Health Choices  
CARL - Critical thinking and Appraisal Resource Library

**Declarations**

**Ethics approval and consent to participate**

The study was approved by Makerere University School of Medicine Research and Ethics Committee and the Uganda National Council of Science and Technology as part of the Supporting Informed Healthcare Choices in Low-income Countries Project in August 2013 and renewals were obtained for each project year.

All potential participants were asked for, and provided written consent before participating in the study. All participant information was kept confidential and participants could not be identified from the information they provided. We asked participants for additional consent if we intended to use their pictures, video, or audio recordings in the development of the media resources or in presentations and publications.

**Consent to publish**

Not applicable. No personal identification data.

**Availability of data and material**

All data will be available on reasonable request.

**Competing interests**

The authors declare no competing interests

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**Authors' contributions**

DS, AN, SR and ADO drafted this article manuscript. All the authors reviewed the manuscript, provided input, and agreed on this final version. DS and AN were the principal investigators, supervised by ADO, NKS and AF, and supported by other investigators. MO drafted the scripts for the episodes. DS and ADO reviewed them and all investigators provided input. DS translated the scripts to Luganda. DS, AN and ADO wrote the lyrics of the IHC theme song to which other investigators provided feedback. All the investigators participated in the analyses of findings for each iterative cycle and agreed on how to use the findings for the next cycle in the development process.
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