

## Maximising the sharing and reuse of project-specific resources

Although TB receives substantially less funding than other major infectious diseases, such as HIV/AIDS,<sup>1</sup> a large amount of money is spent every year to support research projects.<sup>2</sup> Most of these projects have clearly defined aims and outcomes that address a particular research question. Although there are adequate systems in place to track research project progress and encourage the sharing of outcomes that build the collective evidence base, many excellent resources developed during the different phases of research project planning and implementation are not shared. Resources and tools for research implementation, such as standard operating procedures and patient information materials (see Table 1 for a full list), are rarely intentionally developed for public health reuse. These resources, if designed to be repurposed by other programmes, could reduce the ‘start-up’ effort required to implement TB elimination activities and accelerate the translation of research findings into practice. Publishing research protocols in peer-reviewed, open access journals has become established practice, improving scientific rigour and transparency. This also provides valuable templates for researchers to build upon in other settings. Similarly, there is a real opportunity for research projects to maximise the value generated by designing resources in a way that could be repurposed by other researchers and TB programmes. With rapid technological advances requiring the development of new systems and skills by national programmes, the need for researchers to assist in ‘closing the gap’ between research discoveries and their translation into policy and practice is greater than ever.<sup>3</sup> Open sharing of relevant study resources and tools to support scaled ‘real-life’ implementation offers another avenue to assist national TB programmes and global TB elimination efforts.<sup>4</sup> With strong calls for increased active TB case finding, as well as expanded use of TB preventive treatment (TPT) and new treatment regimens in high-incidence settings,<sup>5</sup> the global TB community would benefit from a curated repository of adaptable implementation tools for future research or public health use.

### NEW ADVANCES NEED NEW APPROACHES

Cooperation and constructive knowledge sharing are powerful tools in the fight against pandemics. In the global TB elimination effort, open knowledge and resource sharing between TB researchers and national

programmes limits duplication of effort and maximises benefit for TB-affected individuals and communities. In our experience, practical implementation resources developed to support TB research projects are infrequently shared in readily editable formats, even among research groups and national programmes working in the same country or geographic region. Although such sharing may occur informally, the materials are rarely intentionally designed for future repurposing, and public availability of these resources is often lacking. We were unable to find published articles that specifically describe or quantify the global good that research groups could achieve through reuse-minded design and sharing of practical implementation resources.

Excellent examples of TB health information and education resources are published by the WHO, United States Centres for Disease Control and Prevention (US CDC)<sup>6</sup> and the Curry Centre (San Francisco, CA, USA).<sup>7</sup> However, TB researchers also have an opportunity to share relevant study resources. Some study tools are shared as supplementary material in manuscripts, but these are usually in non-editable formats and can be subject to intellectual property restrictions. This makes it challenging to adapt these resources for different contexts, including the need to translate text, or edit images to be consistent with local guidelines. Given the great expertise and care that research groups invest in the design and development of these resources, it is worthwhile considering the design platforms that could facilitate repurposing and maximise the return on research investment (Table 2).

The past decade has seen an influx of new tools and technologies to support progress towards eliminating TB. The international research community must seize the opportunity presented by this innovation to promote knowledge-sharing approaches that make optimal use of these advances. A readily accessible and editable corpus of resources could serve as a powerful facilitator of creative new ideas, or assist existing programmes to improve patient and community education and communication. The establishment of a resource library for childhood TB provides an example of what can be achieved, although unfortunately this was not sustained. Ideally, a global technical organisation, such as The Union, could provide sustainability and quality control, but the current lack of a formal repository should not limit the publication of resources in an editable format on

**Table 1** Overview of resources required to deliver population-based TB research projects

Research project domain	Resources to support implementation	Frequency of sharing*
Research outcomes and objectives	Peer-reviewed publications; conference papers; stakeholder presentations	Always
Robust and reproducible methods	Detailed SOPs; diagnosis and treatment algorithms; clinical care pathways; decision aids	Often
Reporting to local and global community	National/WHO reporting, newsletters, conference presentations, websites, blogs	Often
Skilled research teams	Clinical, laboratory, public health training resources for staff including slide sets, training activities, pre/post tests	Sometimes
Data management	Data dictionaries; case report forms; relevant applications; archived research data	Sometimes
Monitoring and evaluation	Ongoing professional development; practical methods of monitoring, review and oversight, monitoring checklists	Infrequently
Community and stakeholder engagement	Stakeholder and community engagement mechanisms, adaptable programme design, mass communication strategy, social media, advertisements	Infrequently
Participant/patient information and education	Posters, counselling material, flipbooks, treatment passports	Infrequently

\* Author experience; no formal published assessment.  
SOP = Standard Operating Procedure.

accessible research websites that are referenced in manuscripts. Given increased global digital connectivity and advances in the access and usability of editing platforms, there is scope for the TB community to consider how research investment can be better leveraged to serve public health implementation activities.

## A CASE FOR CONTEXT

Designing materials with reuse in mind allows iterative, culturally responsive changes to be made throughout study implementation in a way that fosters community empowerment and buy-in.<sup>8-11</sup> Using the example of health promotion and education tools, access to editable draft examples from other research groups in the same region could potentially reduce the time, skill and funding required for resource development (all major constraints within a study project) whilst maximising the time devoted to community co-design and culturally responsive

adaptation. A focus on community involvement in revision, design and messaging of these resources emphasises the importance of the community as partners in TB elimination, and should be prioritised.<sup>12</sup> The proposed shift in practice from the development or use of static health information and educational materials, towards open and cooperative sharing of editable formats, promotes the co-design process and should facilitate people-centred TB care and health education.

### *A Pacific example*

In high TB incidence countries, the existence of local evidence has been identified as an important factor encouraging enhanced TB care and active case-finding.<sup>13</sup> The availability of context appropriate information materials and tools to support programme implementation may be similarly enabling. Resource development for the PEARL (Pathway to the Elimination of Antibiotic Resistant and Latent tuberculosis [and also leprosy] in the Pacific) study,<sup>14</sup>

**Table 2** Editable design platforms commonly used to develop health information and education resources for TB research projects

Type of platform	Example software/service*	Accessibility	Content library and adaptability	Skill level	Cost
Full featured graphic design	Adobe Photoshop, Illustrator, InDesign (Adobe, San Jose, CA, USA)	Requires specialist software; large file size	Content not available in basic package, documents are highly adaptable once created	High	\$\$\$
Online graphic design	Canva, VistaCreate (VistaCreate, Limassol, Cyprus), Glorify (Glorify, London, UK)	Requires online account; shared by web link	Extensive free and paid content available; text is highly adaptable; layout and images are moderately adaptable within platform parameters	Medium	\$
Office document editors	MS Office (MicroSoft, Redmond, WA, USA), LibreOffice (The Document Foundation, Berlin, Germany)	Common software and filetypes; small-to-medium file size	Limited content available depending on software package; text is highly adaptable; layout and images have limited adaptability within platform parameters	Low	\$

\* This is by no means an exhaustive list. It includes the platforms which are, in our experience, most commonly used by researchers and which are compatible with the Microsoft suite.

a population-wide active TB case-finding and prevention intervention in the Pacific nation of Kiribati, provided an opportunity to intentionally design Pacific-focused health promotion resources for later public health adaptation and to enable iterative revision during implementation. The research study combines systematic screening for TB and leprosy with TPT and universal leprosy prophylaxis in a population of ~60,000 people. In the development of health information and education materials for the study, the main considerations were 1) What resources to develop and share? 2) Which software/service to use for the creation of editable versions of these resources? 3) How to disseminate editable and accessible content to other projects and programmes? and 4) What intellectual property implications would arise from our approach?

Due to COVID-19 border closures, provisional resource templates were created by the study team in video-call consultation with the Kiribati National TB Program. Pilot-ready draft versions of the resources were reviewed and translated by the Kiribati Health Promotion Program. Next steps for resource development will be rapid iterative adaptation with community consultation during the pilot phase of the study via focus groups comprised of TB survivors, family members, local health professionals and lay people. Ongoing resource revisions are anticipated and welcomed through regular meetings of our formal stakeholder engagement group and informally via feedback from the local study team. Resources were developed with consideration of their future use by national TB programmes and research groups in other parts of the Pacific. Applying the considerations outlined above, an online graphic design platform (Canva®, free license; [www.canva.com](http://www.canva.com)) was employed to facilitate open sharing and customisation of editable tools without up-front cost, and to enable the translation, alteration of format and the modification of design, including changing image appearance to resemble local people, messaging, branding etc. The draft resources included TB disease, TB infection, leprosy and sputum collection posters, TPT passports for adults and children and a comprehensive 'master' flipbook. They were shared as links to editable English language documents with regional implementation partners, Australian TB programmes working with Pacific communities and published free-to-access on the study website ([www.thepearlstudy.org](http://www.thepearlstudy.org)) under a free-to-edit creative commons license (<https://creativecommons.org/licenses/by/4.0/>). While this is just one example of current research work from the PEARL study, it demonstrates the principle of seeking value beyond the primary research aims by viewing all activities as potential global goods.

## CONCLUSION

TB research projects typically devote most of their energy to meet the stated study aims and to report their findings in peer-reviewed journals. Underpinning these large-scale interventions is an extensive ecosystem of practical 'ways-of-doing-things' knowledge and study-specific resources, which could be of benefit to the larger TB community if shared in appropriate formats. Reporting primary study outcomes is clearly essential to drive innovation towards effective TB elimination, yet unrealised practical resource-sharing potential fails to maximise the positive impact that can be achieved by these publicly funded studies. Viewing resource development and sharing as a complementary study outcome would assist research translation and may also benefit TB programmes. TB education, patient support and counselling resources provide examples of study tools that can be optimised for their added value beyond the specific research project, maximising the return on research investment.

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