

## EXECUTIVE SUMMARY

### Background

Assistive technology can increase independence, function, and quality of life of people with disabilities; however, people living in resource limited environments (RLEs) have less access to the technologies they need.

### Objectives

This technical report summarizes the methods and results of an evidence review of research conducted on assistive technology in RLEs that was conducted to support the development of World Health Organization (WHO) Guidelines on Health-Related Rehabilitation by characterizing the breadth and depth of research in this field, and providing evidence grading and contextual review on a subset of evidence that addresses selected assistive technology questions.

### Evidence Review Process

We conducted our review in two phases. Phase 1 involved a scoping review that was broadly inclusive and aimed for comprehensive coverage regardless of the type or quality of evidence. The scoping review provided a picture of the common assistive technology topics, regions, and populations addressed in the included literature. Phase 2 involved a systematic review of a small subset of high quality research studies for the purpose of providing evidence that might support the development of Health –Related Guidelines.

### Search Strategy

We searched the academic databases Pubmed, CINAHL, EMBASE and Cochrane using a two part search process. Searches were reviewed by a health science librarian and guided by our expert panel. We also included additional publications provided by our expert panel and conducted follow up SCOPUS searches based on high quality RCTs and systematic reviews.

### Selection Criteria

For the scoping review, we included articles that addressed assistive technology as a primary topic, were conducted in RLEs (both in low and middle income countries [LMICs] and in resource limited areas of high income countries), , had been published between 2000-2013, and included research evidence. Studies were not limited by disability type, age, or type of research. For the systematic review, we chose a subset of studies that reported randomized, controlled trials from the articles included in the scoping review.

### Data Collection and Analysis

For the scoping review, exclusion/inclusion decisions were made by one reviewer. A second reviewer coded approximately 10% of all publications for reliability. Extraction was conducted by a single reviewer. A thematic and numeric summary was created based on the extracted elements in order to characterize the available research. For the systematic review, extraction was conducted by one reviewer into the Review Manager (RevMan) software developed by Cochrane Collaboration. Studies were characterized, bias was

evaluated, and outcomes were coded in RevMan. Data from RevMan was then exported to GRADEPro for evidence grading and development of GRADE profiles and Summary of Findings tables.

## **Main Results**

The initial search resulted in 2658 results. After inclusion/exclusion, we excluded 2377 records for a total of 281. During extraction, we excluded an additional 57 records, but added an additional 29 based on follow-up SCOPUS searches and feedback from our expert panel for a total of 253 included publications.

For our scoping review, we determined that there is a general increase in number of publications per year over time, and that research studies are geographically spread across global regions. However, there is still not much research evidence available with an average of only 19 studies per year during the 13 year span of our scoping review. Research is not evenly distributed across assistive technology types. Some assistive technologies have significantly more research and larger samples (e.g., spectacles, wheelchairs). Some important areas of AT have very little research evidence in resource limited environments (e.g., AAC, pressure cushions). There is limited high quality evidence available, with most of the research being observational and only nine randomized, controlled trials.

These nine high quality studies addressed five comparisons:

1. Should ready-made assistive technology be used instead of custom assistive technology for people with disabilities (3 studies on spectacles)?
2. Should assistive technology be delivered to people with disabilities by fitting and dispensing them on the spot, delivering them through a booking order with subsequent delivery or by providing a prescription only (1 study on spectacles)?
3. Should assistive technology be provided free of charge or via prescription to people with disabilities (1 study on spectacles)?
4. Should educational interventions to promote assistive technology use, performance, and safety be implemented versus not for people with disabilities (2 studies—one on spectacles and one on wheelchairs)?
5. Should assistive technologies be fitted using teleaudiology instead of standard face-to-face practice for people with disabilities (1 study on hearing aids)?

Our findings suggest that, at least for spectacles, ready-made products may be a reasonable compromise for a large subset of people who require them and can be provided more quickly with reduced inventory requirements. It also appears that individuals are much more likely to acquire AT (spectacles) if it is provided at the point of service, either on the spot or through a booking order and are much more likely to acquire AT if it is provided free of charge rather than at cost via a prescription.

The research on educational interventions to promote AT use, performance, and safety is more mixed with one large study showing no effect in promoting spectacle use and one small study showing a big effect in improving wheelchair skill performance and safety. Finally, teleaudiology appears to be an effective alternative to face to face fitting of hearing aids.