

# A Pilot Study for Mass Hearing Testing

Determining efficiency and accuracy of protocols



## Situational analysis & overview

Hearing loss has a substantial impact on education and society, and yet Africa's primary health care requirements are not being implemented fully in schools and rural areas and in some countries even urban areas are underserved. 1 in every 12 school aged children have a hearing loss, a significant amount of these cases are preventable or reversible at a primary healthcare level. South Africa's white paper on inclusive education clearly states the need to identify children with barriers to learning, which includes hearing disability, but this is most often neglected.

Globally, hearing loss is one of the fastest growing health concerns, and recently Sub-Saharan Africa has been identified by the World Health Organization (WHO) as having a high prevalence of hearing loss. This should ideally result in a sharpened focus on providing hearing health care, yet there are approximately 800 practicing audiologists in South Africa. This indicates a huge lack of professional help available to service the more than 25 000 schools in South Africa alone.

Other field testing equipment available to professionals does not meet the diagnostic testing requirements. Screening systems are available, but they pose the problem of being manually operated, time consuming, with standardized electronic databases, and requires substantial medical resources. The most significant obstacle encountered by using standard equipment and methodology is the high rate of false referrals, which wastes precious resources, and results in otherwise healthy people being referred to medical professionals for unnecessary assessments and treatment. This puts a huge burden on the state and private health care clinics.

Furthermore hearing loss will keep growing, some 1.1 billion teenagers and young adults are at risk of hearing loss due to the unsafe use of personal audio devices, including smartphones, and exposure to damaging levels of sound at noisy entertainment venues such as nightclubs, bars and sporting events, according to WHO. Hearing loss has potentially devastating consequences for physical and mental health, education and employment. The fight against the impact of hearing loss in the school and work space will thus only prove to be more challenging as the hearing loss increases in the future.

An undoubtedly important assessment is overlooked due to previously inadequate technology services. Now these services are available with the latest in hearing technology. Faster, more accurate and more cost effective than ever before, Cenkmmed offers hearing solutions with the KUDUwave audiometer.

Creating a health services process aimed at assessing and diagnosing hearing loss in school children has been our most recent focus. The KUDUwave™ is the first in series of devices to be distributed by Cenkmmed, and in the spirit of a combined approach in both software and hardware, it provides a revolutionary approach to audiometry. Our system has proven to be successful by accurately assessing over 100 patients in one hour with only 1 healthcare professional present, trained support staff are needed onsite, the healthcare professional may be present physically or via telemedicine enabled by our preferred products.

## Efficiency Report & Comments

Pilot study done over 3 days in 3 different locations with 3 different team setups to assess the efficiency of doing full diagnostic testing vs screening, as well as assisting in assessing traditional screening and testing methods compared to Cenkmmeds methods and implementation.

The Pilot study was done as a charitable event in collaboration with Rotary Health International and Gift of the givers, thus the report also consists of achievements and targets specifically related to the purposes of testing and thus will not focus solely on the testing procedure and protocols developed.

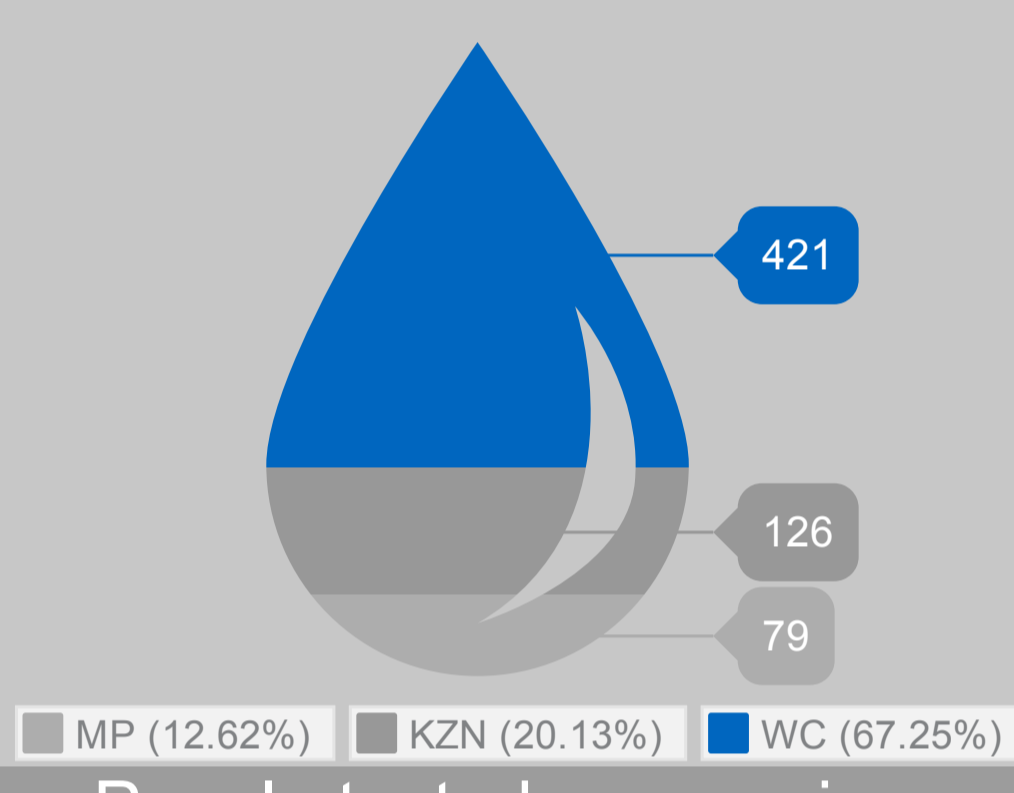
Please note the same equipment was used at every site, the amount of skilled and unskilled staff however differed significantly from site to site. At our peak site we fell only 300 tests short of the world record for hearing tests, which was achieved with 24 audiometers and approximately 30 audiologists with over 8 hours of testing.

# 626 People Tested

over 3 days in 3 provinces.

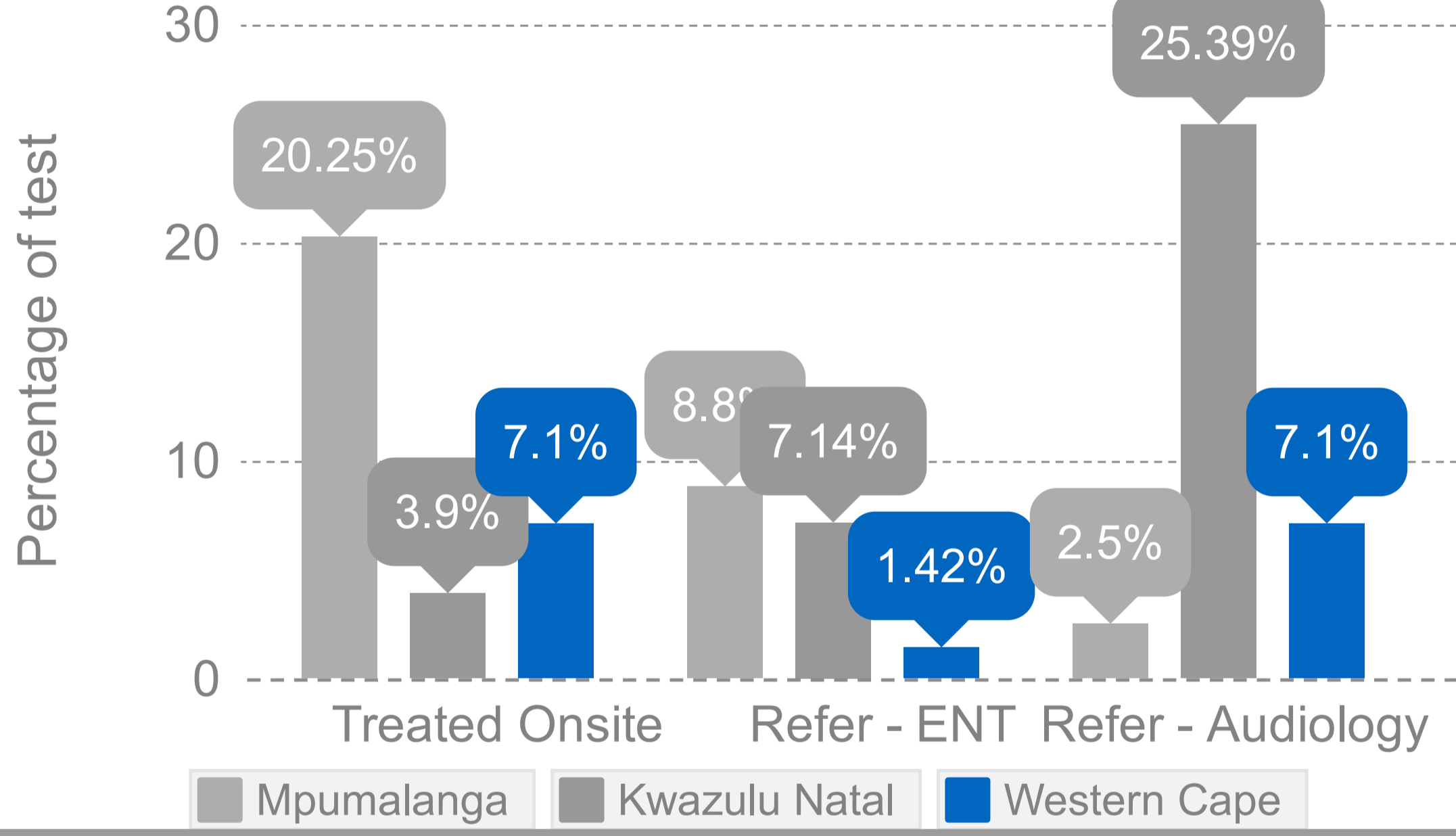
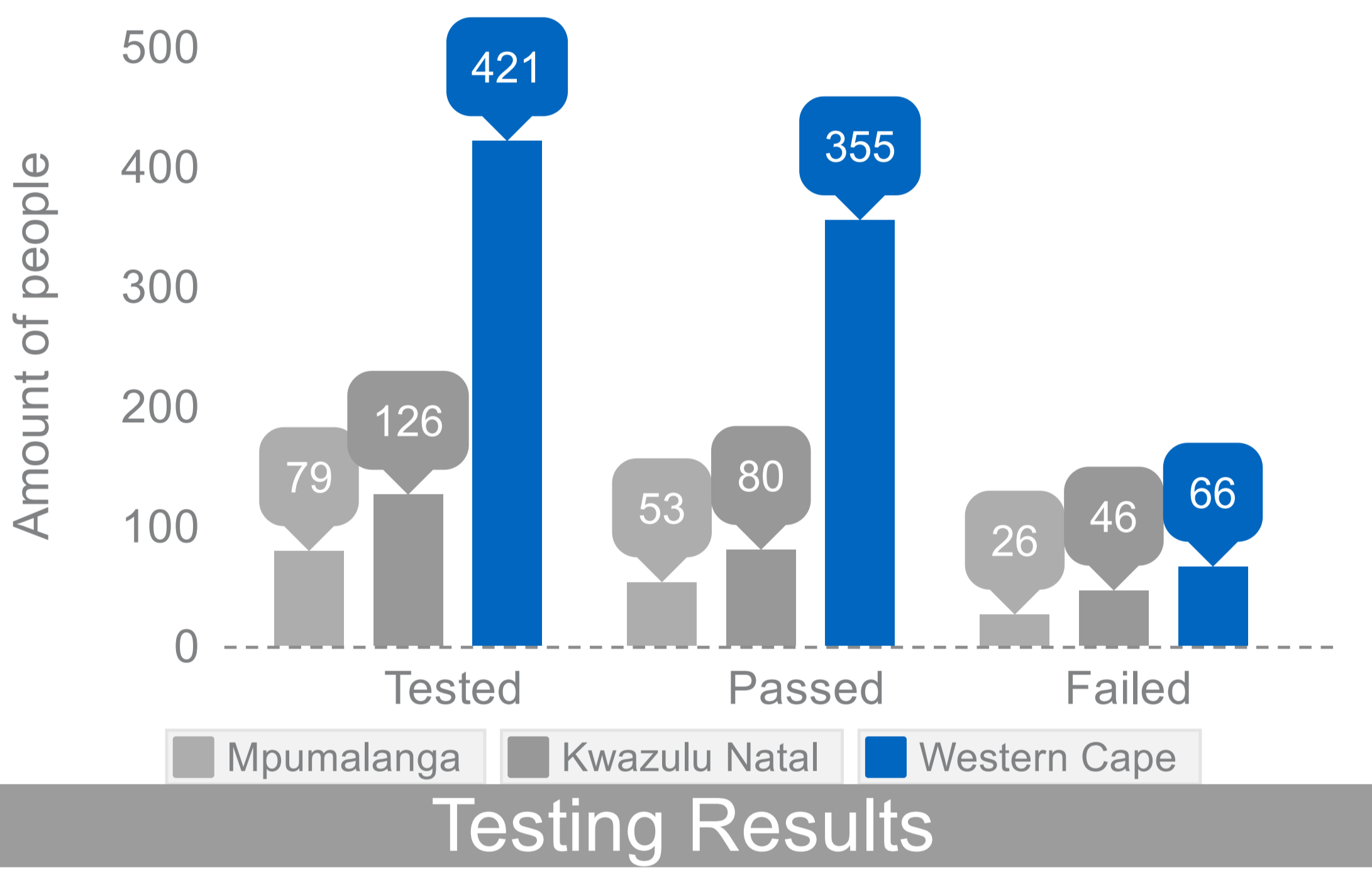
We aimed to test, diagnose, treat and accurately refer all patients that came to do hearing tests, in this we succeeded in each of our locations. All the individuals that wanted testing at each event was accommodated.

Treatment on the day included some or all of the following; partial or full removal of wax and foreign bodies, prescriptions, hearing aid repairs and fittings.



## Province Breakdown

Each province had its own unique setup, successes and challenges, though overall we were successful.



### Mpumalanga, Thulumahashe Stadium

With low numbers visiting the testing stations due to arrangements for the day, which we were unaware of, we tested the least amount of people at this site, however due to partnering with the Starkey foundation this site had the highest percentage of people fully treated onsite making it a tremendous success.

### Kwazulu Natal, Dawnridge Primary School

This site had the most medical professionals on site and used a traditional method of screening, this site only performed threshold air conduction testing, this site still managed to test and accurately refer and treat many patients in the time allotted on site. Testing without full diagnostic had a clear effect on referral rate which strengthens our position on insisting on diagnostic testing at future events.

### Western Cape, Matthew Goniwe Memorial High School

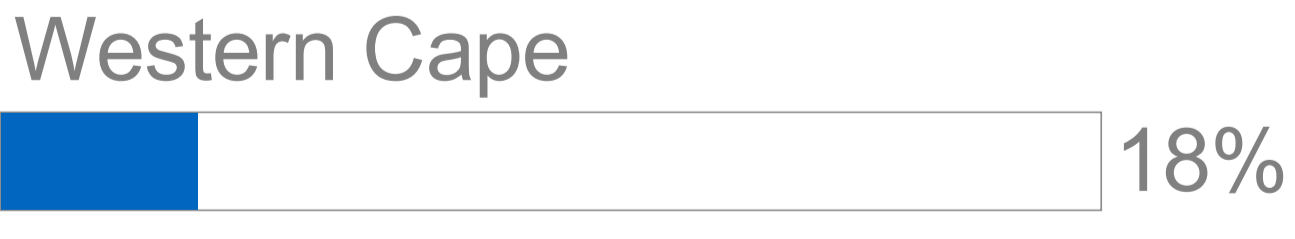
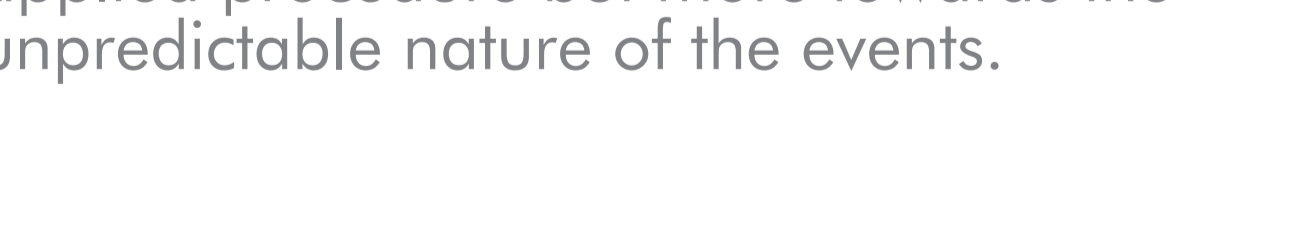
By far our most successful site, even with the limited time we were given to test in and the lack of professional resources this site showcased the true potential of this project and the impact it can have in a community. With only 8 audiometers and 3 Audiologist. This shows the ideal setup for efficiency and accuracy.

## Resource Analysis

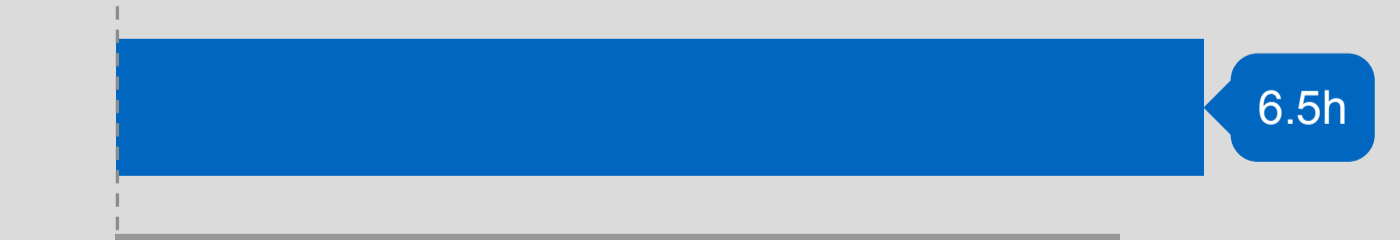
A maximum redundancy of 20% was predicted, with the expectation of 6-8 hours of testing time and 400-600 patients available for testing. Unfortunately due to poor patient attendance, redundancy proved larger than expected at most sites. Fortunately these constraints were external factors and does not speak to the applied procedure but more towards the unpredictable nature of the events.

Whilst 100% of people who signed up for hearing care were tested at each site, a major factor to the numbers that were tested was the allotment of time given to test at each site. We expected 7-8 hours of testing time though this was not reached, Mpumalanga was the most challenged in this aspect and thus in future, time allotment will take more president in procurement and resource allocation.

### Resource redundancy



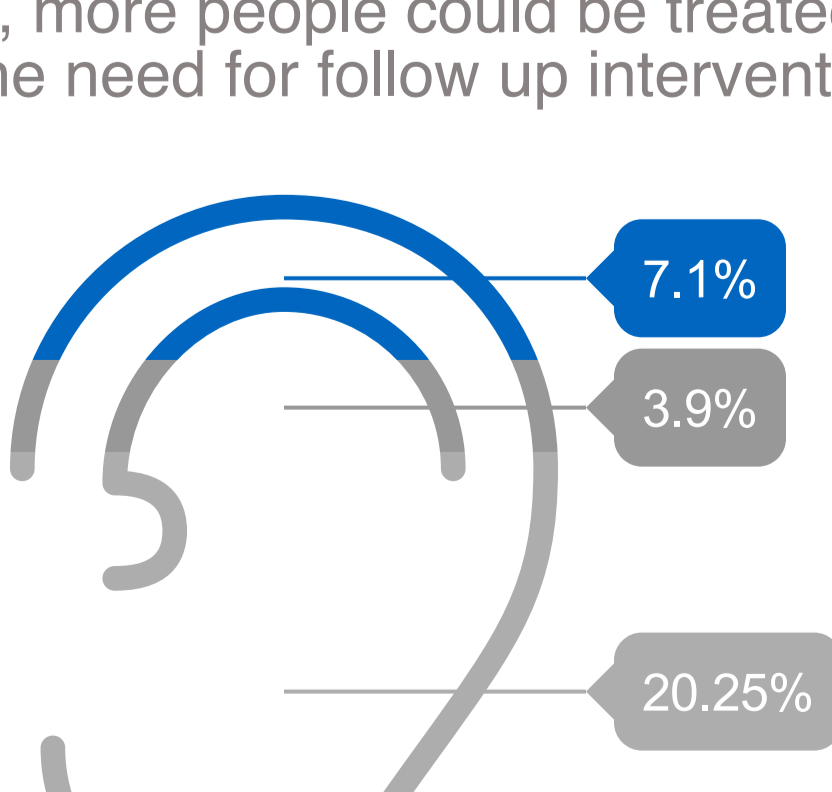
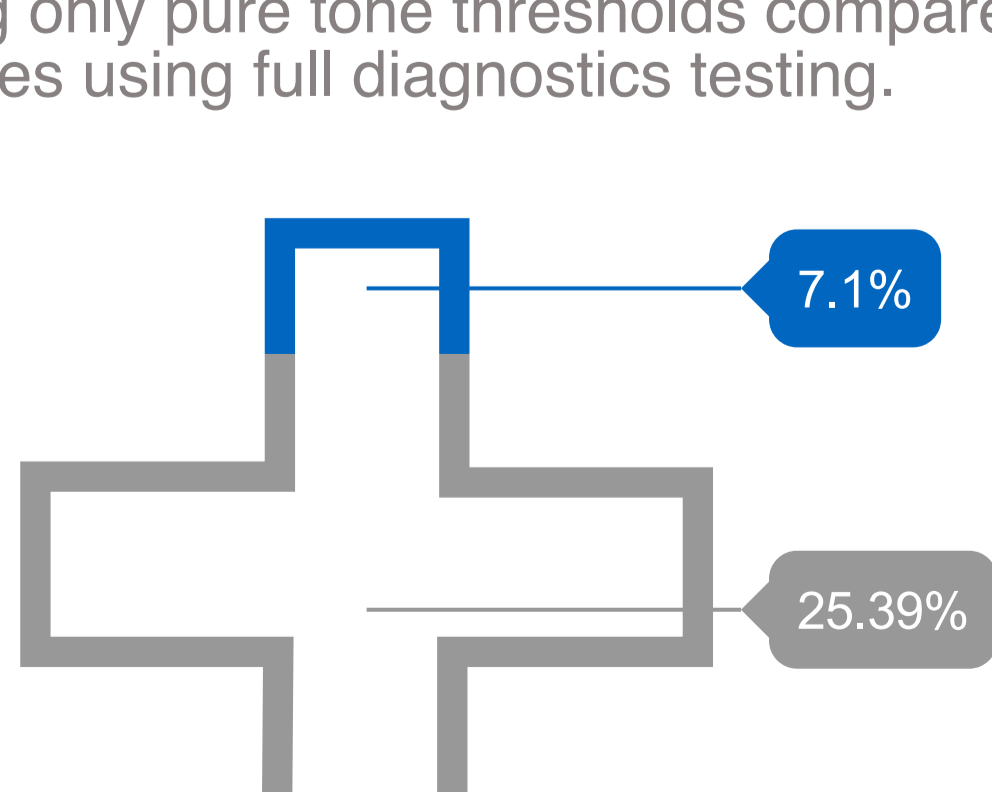
### Time allotted for testing



## Most significant statistics

Kwazulu Natal showed a very high referral rate of 25% due to using only pure tone thresholds compared to the other sites using full diagnostics testing.

Due to a partnership with the Starkey foundation in Mpumalanga, more people could be treated onsite, decreasing the need for follow up intervention.



If you have any queries or further insight regarding this report, please feel free to contact us.

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