Summer Internship Report

At

IQVIA Consulting & Information Services India Pvt. Ltd.

(22nd April to June 21st, 2024)

Large-Scale Scientific Study on Existing (Hand-Held) Autorefractor Technologies and Delivery of Associated Services

By

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(PG/23/071)

PGDM (Hospital and Health Management)

2023-2025

International Institute of Health Management Research, New Delhi

Acknowledgement

A Summer Internship is an invaluable opportunity for personal and professional development, and I feel incredibly fortunate to have had the chance to grow within the Public Health Sector. I want to express my deepest gratitude to everyone who has supported me along this journey.

Firstly, I am truly thankful to **Dr. Santosh Moses**, **Ms. Jyoti Mittal** and **Ms. Parul Sharma** from the Health Finance Team at IQVIA for their guidance, expertise, and unwavering support throughout my research. Their advice and encouragement have been crucial in shaping my internship experience.

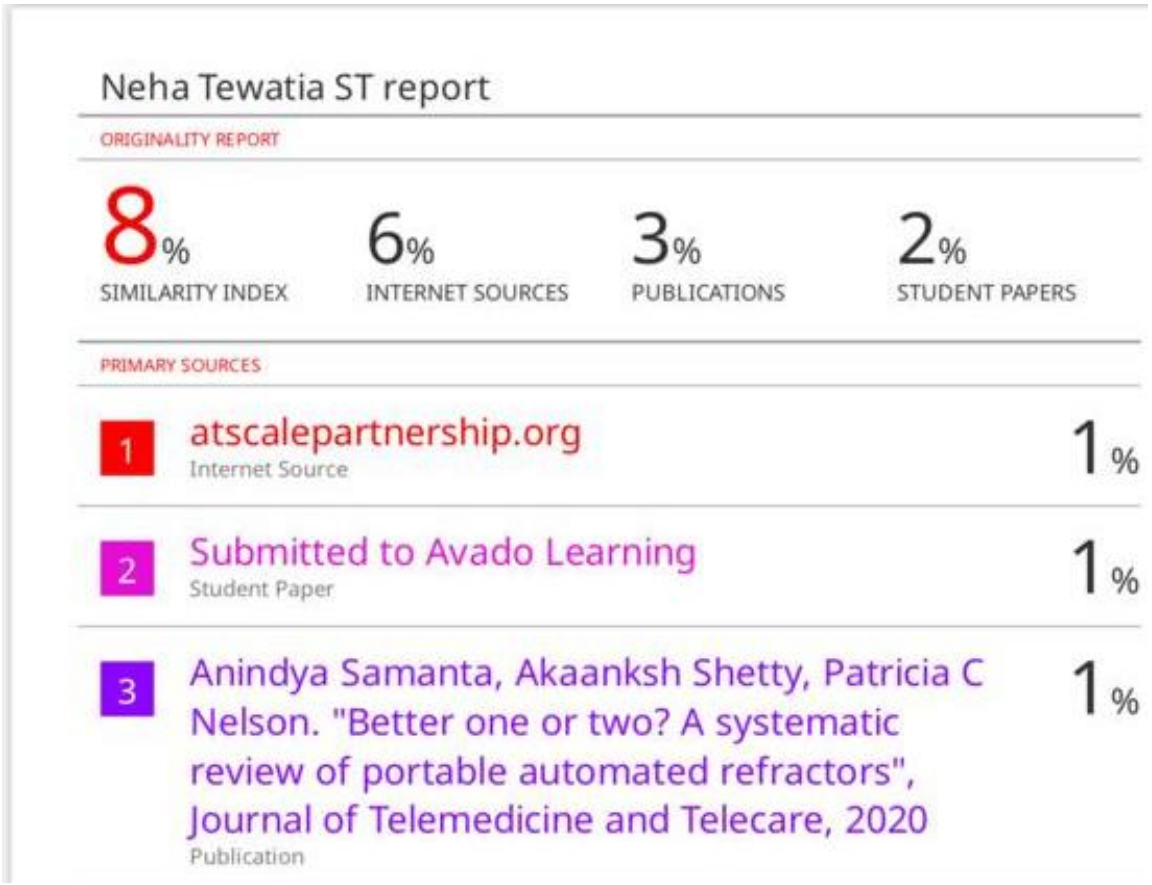
I am grateful to **Mr. Mukesh Ravi Roshan**, my Summer Internship Mentor, for generously sharing their time, knowledge, and experiences, which have greatly enriched the quality of my work.

I am also thankful to my college, **International Institute of Health Management Research, New Delhi** for providing me with this excellent internship opportunity. Lastly, I would also like to thank my friends and colleagues, whose collaboration has been essential to the successful completion of this project.

I am sincerely thankful to have had the chance to work with such inspiring individuals. Their belief in me has inspired me to continuously improve myself.

With warm regards and sincere gratitude,

Neha Tewatia



Neha Tewatia ST report

ORIGINALITY REPORT

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SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	atscalepartnership.org Internet Source	1%
2	Submitted to Avado Learning Student Paper	1%
3	Anindya Samanta, Akaanksh Shetty, Patricia C Nelson. "Better one or two? A systematic review of portable automated refractors", Journal of Telemedicine and Telecare, 2020 Publication	1%

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21st June 2024

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Neha Tewatia** was associated with **IQVIA Consulting and Information Services India Private Limited ("IQVIA")** on the **Large-Scale Scientific Study on Existing (Hand-Held) Autorefractor Technologies And Delivery Of Associated Services** as a part of the curriculum during the period from **22nd April 2024** till **21st June 2024**

This certificate is being issued to recognize successful completion of her internship.

For IQVIA Consulting and Information Services India Pvt. Ltd

VARINDRA Digitally signed by VARINDRA
Date: 2024.06.21 21:44:26 +05'30'

Varindra B
Director - Human Resources, South Asia

FEEDBACK FORM

(Organization Supervisor)

Name of the Student: Neha Tewatia

Summer Internship Institution: IQVIA, Delhi

Area of Summer Internship: Health Financing

Attendance:

Objectives met: ① Was engaged in ongoing projects

Deliverables: ① Prepared project reports

Strengths: ① Keen learner
② Good understanding of subject matter

Suggestions for Improvement:
① Improve on developing presentations
② Improve on secondary research

Signature of the Officer-in-Charge (Internship)

Date: 14-06-2024
Place: Delhi

Certificate of Approval

The Summer Internship Project of titled "**Large Scale Scientific Study On Existing (Hand-Held) Autorefractor Technologies & Delivery Of Associated Services** " at **"IQVIA Consulting & Information Services India Pvt. Ltd, Delhi"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of **Post Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed, or conclusion drawn therein but approve the report only for the purpose it is submitted.

Dr. Mukesh Ravi Raushan

Assistant Professor

IIHMR, Delhi

FEEDBACK FORM

(IIHMR MENTOR)

Name of the Student: Neha Tewatia

Summer Internship Institution: **IQVIA Consulting & Information Services India Pvt. Ltd, Delhi**

Area of Summer Internship: Health Financing

Attendance: Perfect adherence to internship norms

Objectives met: Engaged in ongoing projects.

Deliverables: Prepared project reports.

Strengths: - Strong willingness to learn and improve
- work well in team.

Suggestions for improvement:

Raghav 11/12/24.

Date: **Signature of the Mentor**

Tables of contents

List of figures

List of tables

Acronyms / Abbreviations

AMD	Age-related Macular Degeneration
ARFs	Amblyogenic Risk Factors
AT Scale	Assistive Technology for Global Partnership
CAGR	Compound Annual Growth Rate
CMB	Christian Blind Mission
CP	Cylindrical Power
FDA	Food & Drug Administration
HHAs	Handheld Autorefractors
IAPB	International Association of Preventive Blindness
LMICs	Lower Middle-Income Countries
LVPEI	LV Prasad Eye Institute
MCR	Major Clinical Response
NGO	Non- Government Organization
NPV	Negative Predictive Value
PPV	Positive Predictive Value
ROC	Receiver Operating Characteristic
SE	Spherical equivalent
SP	Spherical Power
ToR	Terms of Reference
WHO	World Health Organization

I. Observational Learning

Section 1: Introduction

1.1 IQVIA Global

IQVIA is a leading global provider of consulting and technology solutions, and data services working exclusively in healthcare domain. IQVIA's global business is spread across multiple regions namely – **Europe, Middle East & Africa, and South Asia (EMEA & SA), Asia Pacific, US & Canada, Latin America, and Japan**, thereby enabling IQVIA to provide a suite of tailor-made services to the clients across the globe.

90,000 + Experts serving clients in **100+** countries	**15B +** Global Revenues, NYSE listed	**30,000 +** Technology experts, Advanced analytics/ data scientists / statisticians, Epidemiologists, PhDs, Medical Doctors, Service Experts	**70** Years of experience as founded in **1954**	**60 +** Petabytes of Unique data

IQVIA's Presence in India

20+ Years of experience

15 Offices in 8 States

200+ PH Experts

IQVIA works with major governments and development partners across India to strengthen various aspects of Public Health

IQVIA in India has a strong public health practice of delivering more than 200 projects spread across multiple domain areas namely, health financing, healthcare infrastructure, health systems strengthening, quality improvement, nutrition, community-based healthcare, social inclusion, family planning, gender interventions, capacity building, etc.

In India, IQVIA is closely working with major development partners such as **Asian Development Bank**, **World Health Organisation**, **United Nations Children's Fund**, **United Nations Development Programme** etc, and with both **Central and State government departments** which includes Ministry of Health & Family Welfare, National Health Authority, Niti Aayog, Central Bureau of Health Intelligence, Ministry of Housing and Urban Affairs, Ministry of Women and Child Development, National Health System Resource Centre, etc.

1.2 Objectives

- To learn project life cycle management along with contributing to ongoing projects.
- To enhance communication and teamwork skills by collaborating on group projects.
- Improve my ability to work independently and manage time effectively.
- To develop understanding and skills on conducting extensive secondary research, data compilation, documentation, and presentation.

Section 2: Mode of data collection

A secondary landscape review was conducted, using an extensive keyword-based secondary searches on databases like PubMed, Embase, and Clinicaltrials.gov, focusing on English-language studies discussing portable autorefractors were done. Criteria such as agreement and sensitivity were used to identify relevant devices. Secondary research gathered specifications based on effectiveness, ease of use, and adoption suitability. Studies assessed aspects like sample size, comparison with other methods, and agreement values between devices. Information from literature was combined with specifications from brochures of 22 HHAs and 8 novel technologies

Section 3: General findings on learnings during the internship

Health Financing Team

IQVIA has a team of employees working closely with several stakeholders such as government organisations, donor entities and multilateral/ bilateral organisations for service delivery across Southeast Asia and Central Asia. IQVIA team works across health financing and digital health domains. The service offerings include:

- Setting up PMUs
- Research
- Monitoring & evaluation
- Knowledge partner
- Capacity building
- Policy Advocacy

They also facilitate with budgeting, forecasting, and health financial schemes, planning, ensuring comprehensive service delivery. The team works closely with clients to understand their specific requirements and, provides solutions that are both efficient and effective.

Section 4: Conclusive learning, limitations, and suggestions for improvements

4.1 Conclusive learnings

- Enhanced research skills by gathering reliable data from market statistics, industry reports, and academic publications.
- Gained experience in data organizing, formatting, and presenting.
- Developed strong time management and prioritization skills by successfully managing multiple projects and meeting deadlines.
- Improved professional communication skills, including email etiquette and presentation delivery.
- Engaging with people from varied areas of experience and expertise.

4.2 Limitations

One limitation of the study was the reliance on secondary research, which constrained the depth and specificity of the findings. The pre-existing data used might not have perfectly aligned with the study's objectives, limiting the ability to tailor insights precisely to the research questions. Additionally, the availability of the device posed a significant constraint. Limited access to the device prevented extensive hands-on experimentation and real-time data collection, thereby restricting the study's practical validation and comprehensive analysis.

4.3 Suggestions for improvement

- Support interns' development by providing access to online courses and training tailored to their projects. This initiative will enable them to enhance their job-related knowledge and skills, fostering valuable learning opportunities.
- Provide interns with a comprehensive experience by exposing them to various departments within the company. This rotation will illustrate the collaborative nature of the organization and allow interns to explore different areas, facilitating the discovery of their interests and the development of a diverse skill

II. Project Report-Large-Scale Scientific Study on Existing (Hand-Held) Autorefractor Technologies and Delivery of Associated Services

Section 1: Introduction

1.1 Rationale

Globally, approximately 2.2 billion people suffer from vision challenges, with around 1 billion affected by preventable blindness due to conditions like glaucoma, cataracts, and myopia. Uncorrected Refractive Error (URE) alone affects about 88.4 million individuals, and other significant issues include cataracts (94 million), Age-related Macular Degeneration (8 million), glaucoma (7.7 million), diabetic retinopathy (3.9 million), and uncorrected presbyopia affecting 826 million people. Poor vision substantially hampers individuals' abilities to perform well at work or school, limiting their economic contributions. Providing eyeglasses to those with refractive errors can lead to significant economic savings and improvements in quality of life. Conditions like myopia, hyperopia, and astigmatism, which arise from genetic, developmental, and environmental factors, are among the most common causes of vision impairment. Addressing URE is critical for enhancing societal well-being and economic productivity.

1.2 Research question

How effective are Handheld Autorefractors (HHAs) in diagnosing and managing refractive errors compared to traditional methods, and can their usage be expanded in public health settings to improve access to eye care in low- and middle-income countries?

1.3 Objectives

Primary objective

To conduct a landscape review for handheld autorefractors including innovative technologies and study their efficacy, in comparison to other refraction devices (desktop and retinoscopy) across both children and adults.

Secondary objectives

- To examine the capacity for expanding the use of auto-refractor technologies in public health settings, considering factors such as technical feasibility, affordability, transferability of skills, and regulatory considerations.
- To find out the top 6 autorefractors amongst the globally available ARs to further conduct a community study in selected 3 LMICs.

Section 2: Mode of data collection

A secondary landscape review was conducted, using an extensive keyword-based secondary searches on databases like PubMed, Embase, and Clinicaltrials.gov, focusing on studies discussing portable autorefractors were done. Criteria such as agreement and sensitivity were used to identify relevant devices. Secondary research gathered specifications based on effectiveness, ease of use, and adoption suitability. Studies assessed aspects like sample size, comparison with other methods, and agreement values between devices. Information from literature was combined with specifications from brochures of 22 HHAs and 8 novel technologies.

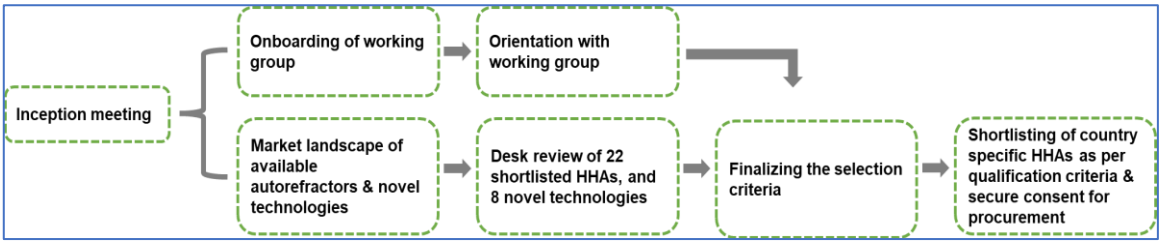

Figure 1:Workflow

Section 3: Desk review

A comprehensive market analysis was conducted to identify various autorefractors available worldwide, focusing on their clinical applications, reliability, and their incorporation into the market landscape for home healthcare aides and novel technologies.

3.1 What are autorefractors

ARs are diagnostic instruments used by eye care professionals to measure a person's refractive error and determine their eyeglass prescription. Refractive error refers to the inability of the eye to properly focus light onto the retina, resulting in blurry vision. This error can occur due to irregularities in the shape of the cornea, lens, or overall length of the eye.

3.2 Significance, advantages, and disadvantages of autorefractors

ARs are extensively employed by eyecare professionals for measuring refractive errors, offering consistent, reliable, and precise diagnoses. They provide a viable alternative to retinoscopy, which is time-consuming and requires significant expertise to perform. [1]ARs demonstrate notable accuracy in detecting astigmatism and are particularly valuable in evaluating refractive errors in uncooperative children, as they offer rapid assessments. In addition to highly skilled eyecare professionals, ARs can be operated with ease and minimal training by clinical ophthalmic assistants, mid-level ophthalmic personnel, and other unskilled healthcare workers such as community health workers and nurses.[2]

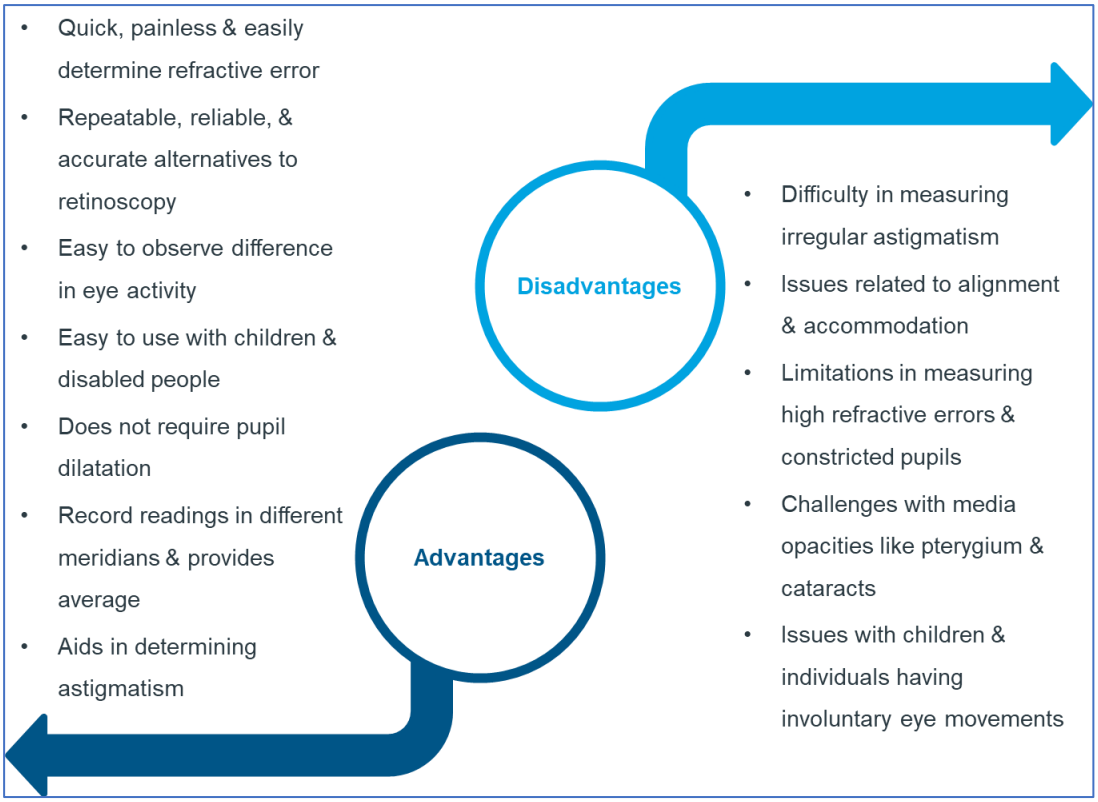

Figure 2:Advantage & disadvantage of autorefractors

3.3 Types of autorefractors

Since the 1960s, numerous novel ARs has emerged in the market. In recent years, there has been ongoing advancement in AR technology, with a focus on improving reliability, repeatability, and accuracy. The following section on market landscaping provides detailed information on various types of ARs. [3] [4] [5]Autorefractors are crucial in identifying refractive errors, aiding in the timely detection and prevention of major refractive disorders. Currently, both table-mounted and handheld autorefractometers are available, offering quick and accurate measurements of refractive errors. However, while table-mounted autorefractors are non-portable and not suitable for individuals who are immobile or face challenges accessing a vision centre, handheld autorefractometers offer portability and ease of use. These portable diagnostic devices measure the refraction of light as it enters and exits the eye.

3.4 Working of autorefractors

ARs utilize a sensor to detect reflections from an infrared light cone, aiding in estimating an individual's refractive error. The process involves presenting an image to the person's eye, with infrared light rays from the image passing through the lens and reaching the retina. As these rays reflect from the retina and pass back through the eye's optical lens, any imperfections or optical defects cause distortion and defocusing of the image on the retina. The device then corrects the reflected image using its lenses and software until all imperfections are eliminated, thus estimating the refractive error. Each measurement is

typically repeated 3-5 times, with the mean value considered the final measurement for subjective refraction, providing the ultimate refractive power for spectacle prescription. An extensive market analysis was conducted to compile a list of 22 handheld autorefractors HHAs and 8 innovative technologies worldwide.

ARs come in two forms: tabletop or desktop models and Handheld Autorefractors HHAs. Tabletop or desktop models are larger, heavier, and non-portable, while HHAs are smaller, lighter, and portable. The cost of each instrument varies from $1,000 to $30,000 USD based on their complexity and intended use.

3.5 Literature review of HHAs and novel technologies

The demand for HHAs is on the rise due to the increasing need for portable and effective eyecare devices. Various brands like Netra, ClickCheck, Zeiss, EasyRef, 3nethra abbero, E-see, Quicksee, PlusoptiX, FF 450 plus, Instaref R20, i.profiler A12R/A12C, and others offer a range of features and price options in the market. Market trends focus on enhancing portability, user-friendliness, and incorporating technology for more precise measurements. Reviews and comparisons among different HHA models provide valuable insights into their performance in clinical settings. Each device has its own strengths and limitations tailored to specific needs and usage scenarios. The market value of HHAs varies between countries, influenced by factors such as healthcare infrastructure, technology adoption, and regulatory policies

S. No.	Product name	Company	Price (USD)
1	Smart scope	OptoMed, Oulu, Finland	822
2	Netra	EyeNetra, USA	1,290
3	Instaref R20	Remidio, India	2,650
4	E-see	Aurolab, India	2,772
5	EasyRef	Moptim, China	3,100
6	3nethra aberro	Forus Health, India	3,696
7	HAR 680	Redsun, China	3,900
8	HAR 800/880	Moptim, China	4,300
9	FF 450 Plus	Carl Zeiss Meditec, Dublin, Ireland CA	4, 691
10	Souer SW 800 vision screener	Optohellas, Greece	4,900
11	PlusoptiX A12R/ A12C	PlusoptiX, Germany	4,924
12	PlusoptiX S12R/ S12C	PlusoptiX, Germany	4,924
13	Welch Allyn SureSight	Hillrom, China	4,995
14	Welch Allyn spot vision screener	Hillrom, China	5,645
15	Vision Screener EVS-1800	US ophthalmic, US	5,890
16	QuickSee	PlenOptika, USA	5,900
17	Pictor	Volk Optical Inc., Mentor, OH, Ohio, US	6,991
18	SVOne	Smart Vision labs, USA	7,000
19	2Win	Adaptica, Italy	9,000
20	Retinomax K-3	Righton Opthalmic instruments, Japan	11,187
21	HandyRef- K	Nidek, Japan	14,112
22	i.profiler	Zeiss, Malaysia	30,000

Table 1:List of available HHAs

Several companies produce handheld autorefractors HHAs with various features and technologies for initial eye examinations. Essilor's ClickCheck, EyeNetra's Netra, ForusHealth's 3nethra aberro, Remidio'sInstaref R20, Plenoptika'sQuicksee, and Aurolab'sEsee employ wavefront aberrometry. PlusoptiX's A12R and S12R utilize eccentric photorefraction. Hillrom's Welch Allyn Spot Vision Screener and Welch Allyn Suresight use Welch Allyn's exclusive technology, each tailored for specific purposes ranging from self-testing to integration into telemedicine platform.

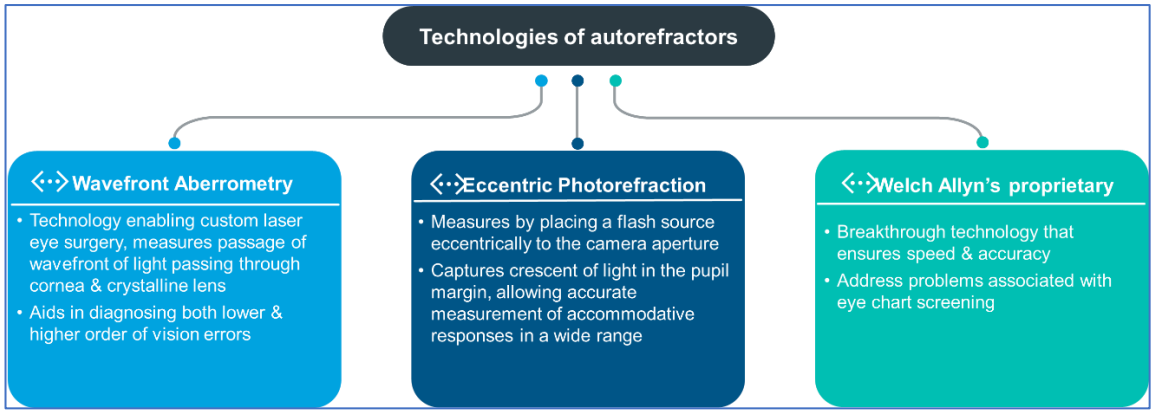

Figure 3:Technologies used by HHAs

These devices have been rigorously tested in clinical settings and have received regulatory approval from organizations like the US Food and Drug Administration (FDA) and CE marking. They are designed to enhance vision care by catering to various needs and demographics with their portable and clinically validated solutions[6]. Particularly valuable in remote or underserved areas where traditional equipment may be lacking, these devices offer convenience. However, it's important to acknowledge that HHAs have limitations in terms of precision and cannot fully replace the need for a comprehensive eye examination. Their usage should be complemented by clinical judgment and patient history. These portable devices provide quick and accurate measurements of refractive errors, assisting in the prescription of eyeglasses or contact lenses.

3.6 Novel technologies for refraction devices

In addition to the technologies highlighted earlier, there is a demand for innovative ophthalmic equipment and methodologies to evolve the delivery landscape.

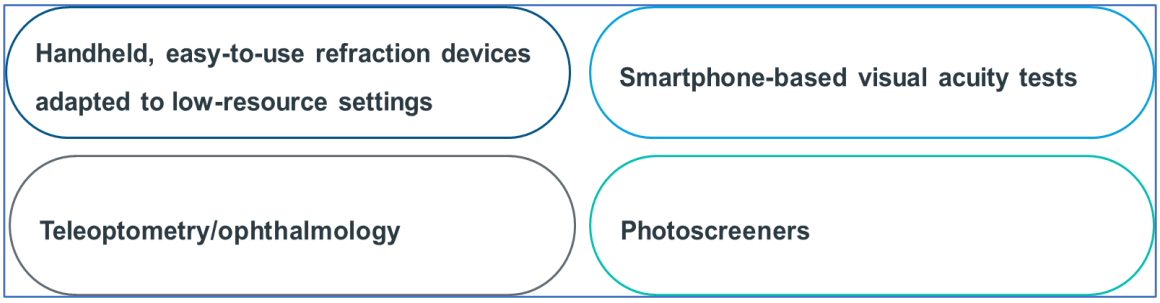

Figure 4:Some of the Novel technologies

The adoption of these technologies has faced barriers due to a lack of standardized

evidence for implementation, limited acceptance by professional optometric associations, and cost concerns. It is critical to establish consensus on clinical, economic, and implementation evidence to demonstrate the cost-effectiveness and simplified service delivery these technologies offer compared to traditional refraction devices. Showcasing their feasibility in larger-scale applications, particularly in low-resource settings, is crucial. Optometric associations may view innovative devices, which enable task delegation to less-skilled workers, as encroaching on their scope of practice. Current competency frameworks don't integrate these innovative devices for task-shifting. Additionally, the substantial investment required for handheld autorefractors, especially in low- and middle-income countries LMICs, poses a challenge, especially when operated by a larger pool of mid-level eye care workers. Various refraction devices like Clickcheck, USee, Vision R 800, VARS, Eyenetra, Self-Adjustable Eyeglasses, Kaliedio, among others, utilize these novel technologies and are invaluable during initial diagnosis.

Section 4: Data Compilation, Analysis, and Interpretation

To proceed with on-ground implementation, they shortlisted six HHAs based on information available in literature review. The selection criteria for shortlisting may be viewed as under, however, the key criteria are detailed below:

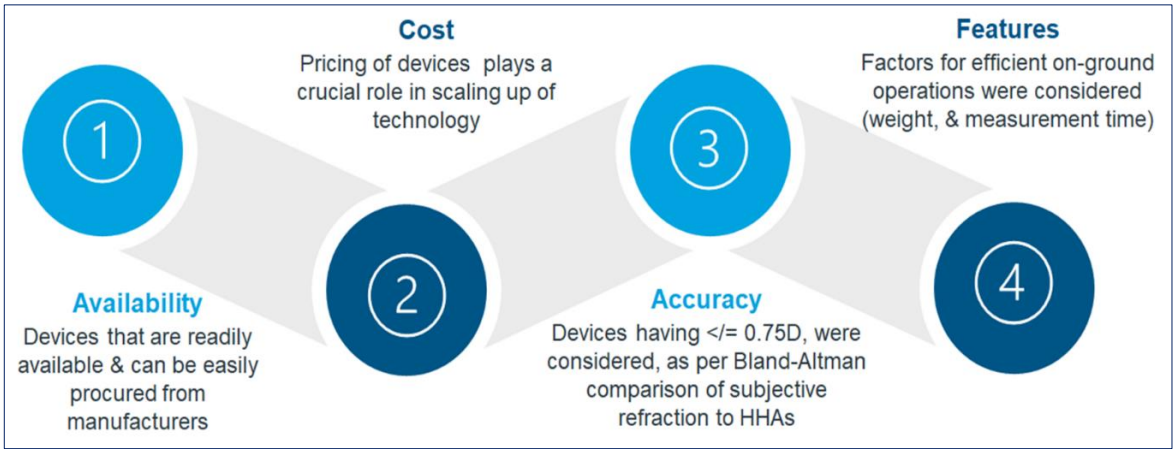

Figure 5:Selection criteria for shortlisting of HHAs

- **Availability:** The first criteria for shortlisting the top 6 HHAs was its availability globally. Funnelling criteria was used to narrow down on the 10/22 HHAs as the manufacturers/ distributors of the 10 HHAs as per scoring matrix are readily available & could be easily procured from manufacturers were shortlisted.
- **Cost:** Owing to the envisioned expansion as a part of scale-up, economics play a pivotal role as they must be considered not only at the time of procurement but also for capacity building and up-keep of the devices. IQVIA & LVPEI understand that every user would aim to deploy the best-in-class devices and use the same for scale-up. However, it may not be ignored that some devices may have comparable outputs in terms of sensitivity and specificity but are very cost effective. Such HHAs will act as

game changers when considered from the scale-up perspective and taking cognizance from the fact, they have shortlisted six HHAs.

- **Accuracy:** The accuracy of an HHA is very crucial in ensuring that the refractive measurements obtained are reliable and can be used for determining the appropriate corrective lenses or assessing changes in a person's vision over time. Factors influencing accuracy included the device's calibration, user proficiency, and the patient's ability to cooperate during the examination. HHAs having </= 0.75D, were considered, as per Bland- Altman comparison of subjective refraction.
- **Features:** This included a quick scan of factors which will be crucial in ground operations of these HHAs including size, weight, time taken per measurement, ease of use and their on-ground portability in low resource settings etc.

S. No.	Technology	Devices	Price (USD)	Accuracy (+/- D)	Measurement time/ eye (Seconds)	Weight (grams)	Total Score
1	Shack Hartamann wavefront	Instaref R20	2,650	0.50	5	450	17
2		3nethra aberro	3,696	0.44	5	650	16
3		E-see	2,772	0.50	10	1,300	15
4	Eccentric photorefraction	PlusOptiX A 12R	4,924	0.75	0	800	15
5		PlusoptiX S12R/ S12C	4,924	0.75	10	Not Available	10
6	Badal Optometer	Clickcheck	55	0.50	Not Available	130	14
7	Welch Allyn's proprietary technology	Welch Allyn Suresight	4,995	0.50	2	900	15
8		Welch Allyn Spot Vision Screener	5,645	0.75	1	2,550	12
9	SynchroScan technology	HandyRef- K	14,112	0.36	240	998	6
10	Autoref. Kerat	Retinomax K-5	7999	8.00	0.14	750	12
11	Innovative Wavefront technology	Eyeprofiler (i.profiler)	9506	0.50	30	30,000	10

Figure 6:Scoring matrix

A conclusive scoring system was established to select the top 6 HHAs These devices underwent assessment on a scale of 1 to 5, categorized across four factors: price, accuracy, weight, and time per measurement. A rating of 5 represented the highest performance, while 1 indicated the lowest score in each respective category. From the shortlisted HHAs and novel technologies, 6 were selected after a comprehensive scoring method basis their availability, price, accuracy, features and ease of use. As per the scores achieved according to the established criteria. Instaref R20, 3nethra aberro, E-see, PlusOptiX A 12R, Welch Allyn Suresight and Clickcheck, secured the maximum scores.

Figure 7:Scoring scale for funneling of HHAs

Section 5: Recommendations

- Expand the use of HHAs-Given their portability and ease of use, HHAs should be prioritized in community-based eyecare programs, especially in resource-limited settings.
- Training programs-Develop and implement training programs for community healthcare workers to operate HHAs effectively.
- Public awareness campaigns-Increase public awareness about the importance of regular eye examinations and the availability of HHAs in community settings.
- Partnerships with NGO hospitals-Strengthen partnerships with NGO hospitals to leverage their advanced facilities and better-trained staff.

Section 6: Conclusion

- The findings indicate that handheld devices can be efficiently utilized as diagnostic tools in resource-limited settings and as screening methods for refraction in epidemiological studies. Several widely used and promoted devices have been subject to studies conducted by eyecare organizations and manufacturers to validate their effectiveness
- The portable autorefractor market is experiencing significant growth driven by factors such as increasing prevalence of visual impairment and demand for eye examinations.
- Technological advancements are enhancing the precision and reliability of portable autorefractors, making them appealing to healthcare professionals and individuals seeking eye care.
- Recent studies systematically evaluated various ophthalmic devices and techniques for measuring refractive errors and prescribing eyeglasses.
- The landscape of handheld autorefractors in eye care is diverse, offering options with varying features, accuracy, and affordability.
- Portable devices play a crucial role in making comprehensive vision assessments accessible, especially in underserved populations and low- and middle-income countries (LMICs).
- They can be effectively utilized in screening programs, epidemiologic studies, scenarios requiring rapid assessments, and with populations such as children and individuals with limited cooperation.
- A systematic literature review compared the accuracy and effectiveness of portable automated refractors to the standard of care, Subjective Refraction (SR).
- Portable autorefractors significantly contribute to addressing the global challenge of uncorrected refractive errors (UREs).

- Autorefraction is increasingly preferred over retinoscopy due to its efficiency, user-friendliness, and better patient tolerance.
- Inconsistencies in measurement can stem from differences in autorefractors, examiner's experience in retinoscopy, type, and protocol of cycloplegic used, and age of the study population.
- Thorough assessment is necessary to consider replacing retinoscopy with autorefractors and other emerging technologies, accounting for these factors.
- Innovation in healthcare technologies can lead to less expensive, more convenient, and more effective treatment options, especially for initial diagnosis in low-resource settings.

References

[1] Autorefractor - an overview | ScienceDirect Topics

[2] https://static1.squarespace.com/static/5b3f6ff1710699a7ebb64495/t/5fe23eb36d6a460dec1bfd50/1608662709292/Product_Narrative-Eyeglasses_a11y.pdf

[3] https://www.latamoptical.com/autorefractor/

[4] ARs - StatPearls - NCBI Bookshelf (nih.gov)

[5] https://lambdageeks.com/autorefractor/

[6] https://static1.squarespace.com/static/5b3f6ff1710699a7ebb64495/t/5fe23eb36d6a460dec1bfd50/1608662709292/Product_Narrative-Eyeglasses_a11y.pdf