Validation of the Refractive Error & Optical Service Delivery Model for Bhutan (Round 2)

Delphi Round 2 Questionnaire

* Indicates required question

Section A: Introduction for Participants

Dear Participant,

Thank you for participation in Round 1 of the Delphi Exercise. Based on your collective ratings, only **3 components reached full consensus (≥70% across relevance, feasibility, impact)** and have been accepted into the final model.

All remaining items are being:

- **Revised for feasibility**, or
- **Reframed for phased implementation**, or
- **Re-tested due to mixed expert opinion**

  Consensus Definition (Round 2)

  Please re-rate each item on a **5-point Likert scale**:

  - **Relevance:** How important is this component for addressing refractive error in Bhutan?
  - **Feasibility:** How realistic is it to implement this component within Bhutan's current system?
  - **Expected Impact:** How much impact will this component have on increasing refractive error coverage and improving equity?

Rating Scale

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

For **every item**, you must:

- Re-rate **Relevance, Feasibility, and Expected Impact**
- Provide a **brief justification at the end if there is strong disagreement**

  There are also open-ended questions at the end to capture your detailed views.

Thank you

Indra

1. ***Before you proceed kindly note the following:***

1. Voluntary participation

Your participation is voluntary, and you can withdraw from the study even after agreeing to participate. We shall not provide any incentive for your participation.

2. Confidentiality

The information that we collect from this research project will be kept totally confidential and will not be disclosed to anyone. The information obtained will STRICTLY be used for this research purpose only.

3. Sharing of results

The questionnaire you fill will be coded and all data will be made anonymous. Individual's names or any personal identifiers shall not be analyzed, reported or published anywhere.

Do you agree to participate?

Mark only one oval.

- ◯ Yes
- ◯ No

Domain 1

Community Level

2. 1. **Community awareness campaigns in local languages** to increase uptake of refractive error services

(Round 1 Agreement Levels: Relevance = 76.7%, Feasibility = 60.5%, Expected Impact = 67.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

3. 2. **Community awareness campaigns in local languages** to improve spectacle compliance and reduce stigma.
Round 1 Agreement Levels: Relevance = 76.7%, Feasibility = 62.8%, Expected Impact = 67.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

4. 3. Provision of **subsidized spectacles (discounted price)** for children, elderly, and low-income groups.
Round 1 Agreement Levels: Relevance = 83.7%, Feasibility = 62.8%, Expected Impact = 76.7%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

5. 4. Provision of **free spectacles** for children, elderly, and low-income groups.
Round 1 Agreement Levels: Relevance = 74.4%, Feasibility = 46.5%, Expected Impact = 76.7%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

6. 5. **Workplace and community outreach** for refractive error should be conducted at least twice annually.
Round 1 Agreement Levels: Relevance = 67.4%, Feasibility = 51.2%, Expected Impact = 65.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

Domain 2

Primary Health Centers and Schools

7. **1. Preschool and school-based vision screening** integrated into existing school health programs. [This is agreed by >75% for all components] Give brief justification if you still thin this is not important.

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8. **2. Task-sharing of vision screening to teachers and health assistants** (after appropriat training)
Round 1 Agreement Levels: Relevance = 55.8%, Feasibility = 44.2%, Expected Impact = 48.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

9. **3. Prescription and dispensing of reading spectacles** by health assistants
[This is disagreed by >75% participants for all components]. Give brief justification if you sti think this is important.

Domain 3

District and 10-Bedded Hospitals

10. **1. Deployment of optometrists to every district hospital and 10-bedded hospital** to provide refraction services.
Round 1 Agreement Levels: Relevance = 65.1%, Feasibility = 48.8%, Expected Impact = 65.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

11. **2. Co-location of optical shops within hospitals** through public–private partnerships (PPP).
Round 1 Agreement Levels: Relevance = 55.8%, Feasibility = 37.2%, Expected Impact = 60.5%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

12. **3. Use of tele-refraction services** in remote districts to support diagnosis and prescription. [This is disagreed by >75% participants for all components]. Give brief justification if you still think this is important.

13. **4. Training of Health Assistants** for vision refraction and dispensing.
[This is disagreed by >75% participants for all components]. Give brief justification if you still think this is important.

Domain 4

District and RRHs

14. **1. Expansion of specialized refractive services** such as pediatric refraction, myopia management, contact lenses, and low vision care.
Round 1 Agreement Levels: Relevance = 79.1%, Feasibility = 69.8%, Expected Impact = 79.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

15. **2. CME and refresher course** for existing eye care professionals on refraction and dispensing.
[This is agreed by >75% for all components] Give brief justification if you still think this is not important.

16. **3. Documentation and reporting** of refractive error cases in ePIS in detail
Round 1 Agreement Levels: Relevance = 83.7%, Feasibility = 69.8%, Expected Impact = 81.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

Domain 5

GKCWNEC (Apex Center)

17. **1. Expansion of specialized refractive services** such as pediatric refraction, myopia management, contact lenses, and low vision care.
Round 1 Agreement Levels: Relevance = 79.1%, Feasibility = 69.8%, Expected Impact = 79.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

18. **2. Myopia control intervention should be strengthened**
Round 1 Agreement Levels: Relevance = 83.7%, Feasibility = 69.8%, Expected Impact = 81.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

19. **3. Training/recruitment of specialized optometrist** to provide advanced refractive error services.
Round 1 Agreement Levels: Relevance = 79.1%, Feasibility = 74.4%, Expected Impact = 79.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

20. **4. Training/recruitment of ophthalmic assistants for specialized** refractive error services.
Round 1 Agreement Levels: Relevance = 76.7%, Feasibility = 74.4%, Expected Impact = 74.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

21. 5. Start the services for **refractive surgery**
[This is disagreed by >75% participants for all components]. Give brief justification if you still think this is important.

22. 6. **Establish optical shop** within the GKCWNEC complex by the hospital.
Round 1 Agreement Levels: Relevance = 67.4%, Feasibility = 55.8%, Expected Impact = 60.5%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

Domain 6

National

23. **1. Establishment of a National Refractive Error Taskforce** under the Ministry of Health/ National Medical Service.

Round 1 Agreement Levels: Relevance = 53.5%, Feasibility = 39.5%, Expected Impact = 48.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

24. **2. Establishment of a stand alone National Refractive Error Policy**.

Round 1 Agreement Levels: Relevance = 55.8%, Feasibility = 41.9%, Expected Impact = 55.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

25. **3. Development of national quality standards and regulatory oversight for optical shops and dispensing practices.**

Round 1 Agreement Levels: Relevance = 81.4%, Feasibility = 67.4%, Expected Impact = 79.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

26. **4.** eREC and spectacle-coverage indicators be integrated into the **Health Management Information System (HMIS)**.

Round 1 Agreement Levels: Relevance = 69.8%, Feasibility = 51.2%, Expected Impact = 69.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

27. **5. Implementation of regular quality audits** and monitoring systems for refractive error services.

Round 1 Agreement Levels: Relevance = 62.8%, Feasibility = 44.2%, Expected Impact = 60.5%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

28. **6. Develop national guidelines** for refractive error management and implement uniformly across the country.

Round 1 Agreement Levels: Relevance = 79.1%, Feasibility = 69.8%, Expected Impact = 74.4%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

29. **7. Inclusion of spectacles in the essential medical supplies list.**

Round 1 Agreement Levels: Relevance = 55.8%, Feasibility = 32.6%, Expected Impact = 48.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

30. **8. Inclusion of spectacle in health insurance coverage.**

[This is disagreed by >75% participants for all components]. Give brief justification if you still think this is important.

_____

31. 9. Bhutan should **establish an in-country optometry degree programme** under KGUMSB.

Round 1 Agreement Levels: Relevance = 55.8%, Feasibility = 51.2%, Expected Impact = 51.2%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

32. 10. Partnerships with **private optical outlets** be formalised for subsidised dispensing in underserved areas.

Round 1 Agreement Levels: Relevance = 58.1%, Feasibility = 41.9%, Expected Impact = 51.2%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

33. 11. Performance evaluation for eye-care staff should include **quality-of-care and productivity indicators**.

Round 1 Agreement Levels: Relevance = 62.8%, Feasibility = 51.2%, Expected Impact = 58.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	⬭	⬭	⬭	⬭	⬭
Feasibility	⬭	⬭	⬭	⬭	⬭
Expected Impact	⬭	⬭	⬭	⬭	⬭

34. 12. Each Dzongkha should have at least one optical shop

Round 1 Agreement Levels: Relevance = 83.7%, Feasibility = 60.5%, Expected Impact = 79.1%

Mark only one oval per row.

	1	2	3	4	5
Relevance	⬭	⬭	⬭	⬭	⬭
Feasibility	⬭	⬭	⬭	⬭	⬭
Expected Impact	⬭	⬭	⬭	⬭	⬭

35. 13. **Population-based RE surveys** (e.g., RAAB/RARE) should be repeated every 5 years

Round 1 Agreement Levels: Relevance = 74.4%, Feasibility = 60.5%, Expected Impact = 76.7%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

36. 14. Eye-health and vision screening education should be integrated into **HA and nursing curriculum at KGUMSB**.

Round 1 Agreement Levels: Relevance = 62.8%, Feasibility = 55.8%, Expected Impact = 62.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

37. 15. Eye-health education and vision screening should be integrated into **school curricula and teacher training**.

[This is disagreed by >75% participants for all components]. Give brief justification if you still think this is important.

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38. 16. Screening of children for admission in pre-primary (PP) should be made mandatory

[This is agreed by >75% for all components] Give brief justification if you still think this is not important.

39. 17. Set up self-check vision screening areas in public spaces and schools

Round 1 Agreement Levels: Relevance = 60.5%, Feasibility = 44.2%, Expected Impact = 55.8%

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

Additional Question based on Quantitative finding

40. 1. Parent education on eye health and children's screen time. *

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

41. 2. Community awareness of refractive error through local leaders (advocacy) *

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

42. 3. Decentralization of reading glasses- making it available in stores other than optical shop

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

43. 3. Mobile refraction units and eyeglasses dispensing (mobile refractive error camps) *

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

44. 4. Latest equipment and devices to delivery the best refractive services *

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

45. 5. National level advocacy on national and local media *

Mark only one oval per row.

	1	2	3	4	5
Relevance	◯	◯	◯	◯	◯
Feasibility	◯	◯	◯	◯	◯
Expected Impact	◯	◯	◯	◯	◯

Open ended questions

46. 1. Which three components are **most critical** for achieving universal eREC in Bhutan? *

47. 2. What **specific strategies** do you recommend to improve equity and affordability of refractive error services in Bhutan?

48. 3. Any other comments

Demographics

49. Name (optional) - Please include if you want to be part of co-author

50. Designation *

Mark only one oval.

- Ophthalmologist
- Optometrist
- Ophthalmic Assistant
- Resident

51. Years of experience in eye health *

52. Age *

Thank you

Thank you for your time and valuable input. Your participation will help ensure that Bhutan develops a refractive error and optical service delivery model that is equitable, feasible, and aligned with the national goal of achieving universal effective refractive error coverage by 2030.

Thank you for taking this survey.

PLEASE NOTE THAT IF YOU HAVE COMPLETED BOTH SURVEYS YOU WILL BE ELIGIBLE FOR GROUP AUTHORSHIP