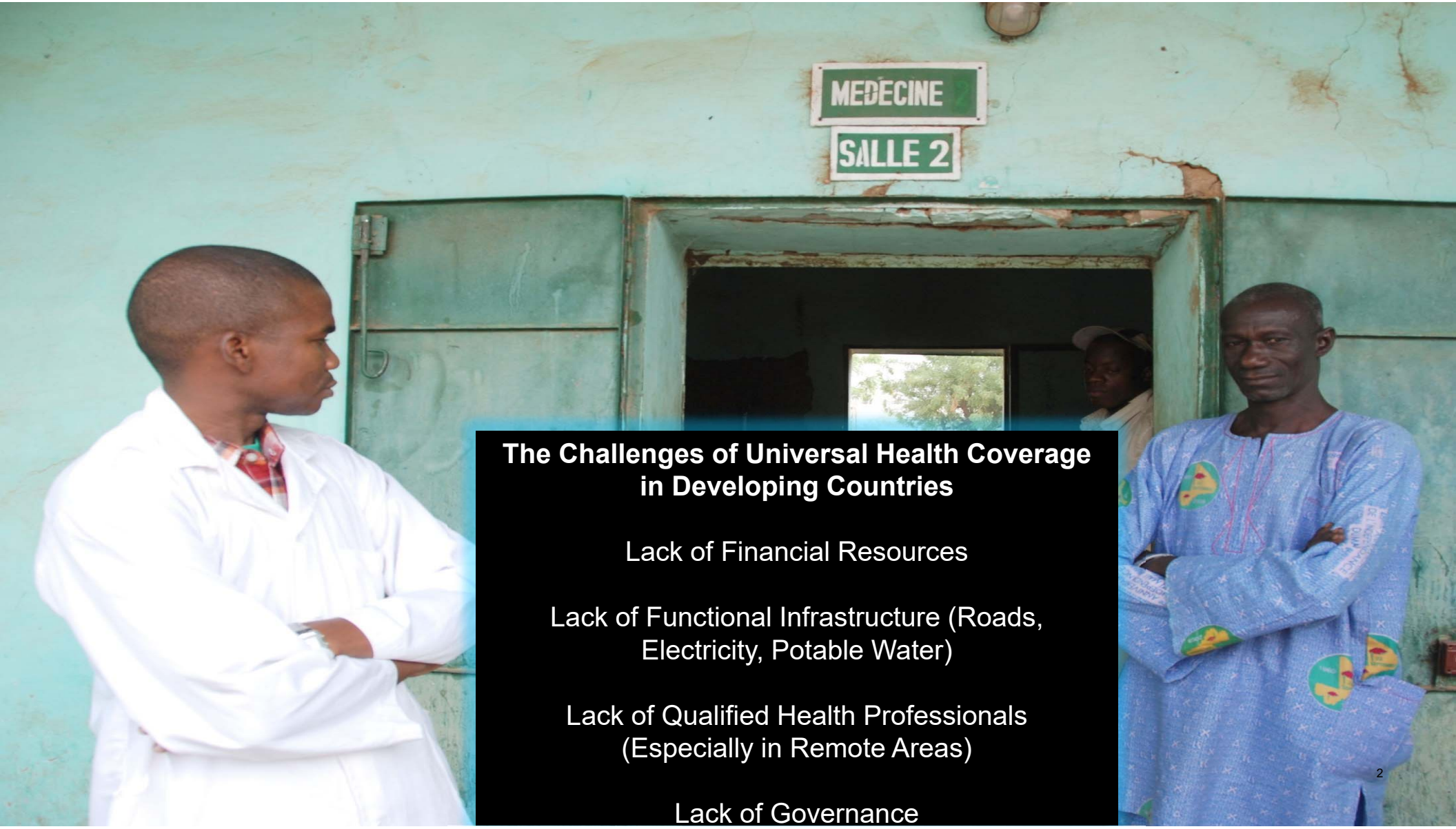
AI and Universal Health Coverage

Cheick Oumar BAGAYOKO, MD, MSc, PhD (Medical Informatics)

June 22, 2021



The Challenges of Universal Health Coverage in Developing Countries

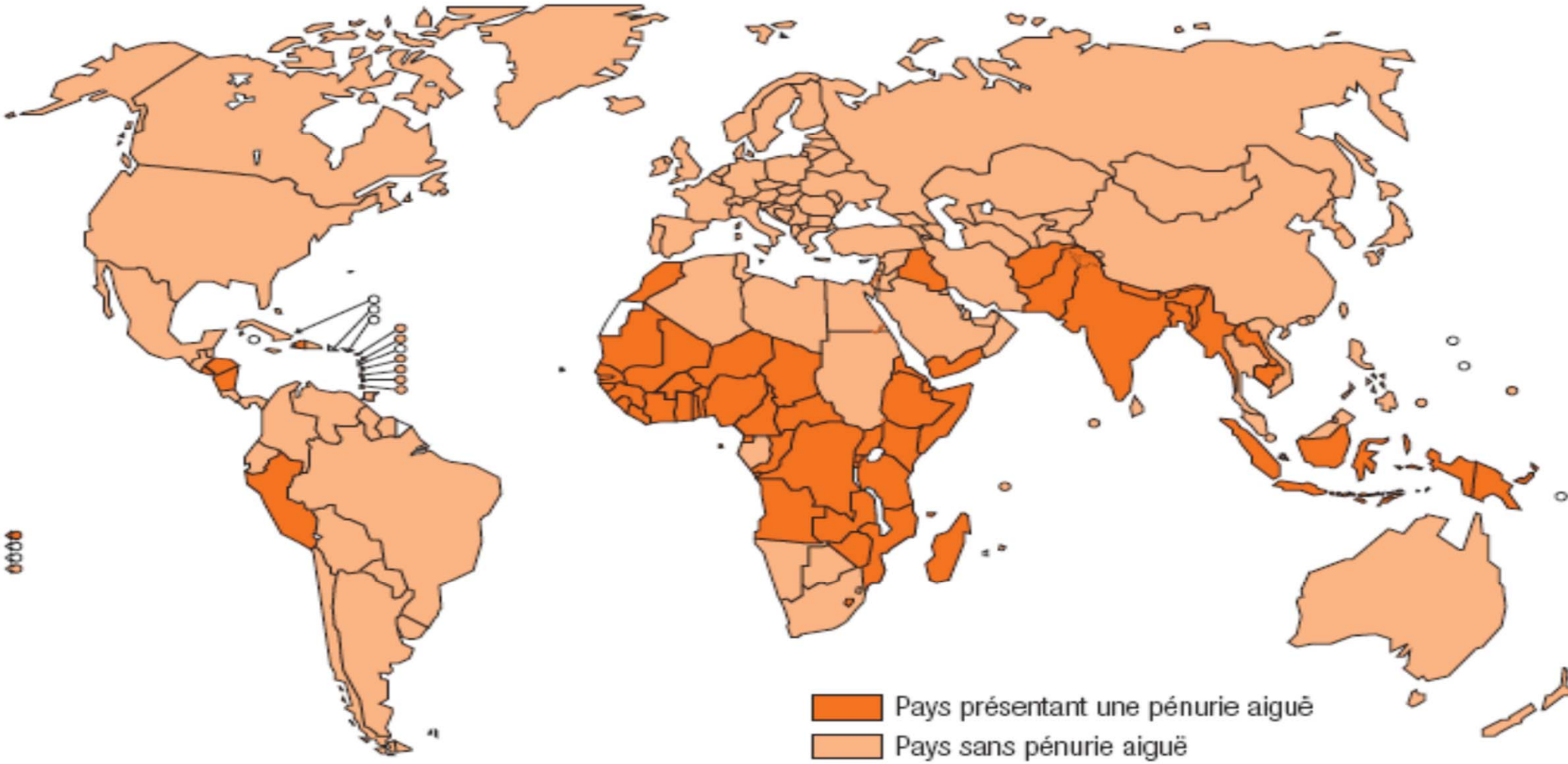
Lack of Financial Resources

Lack of Functional Infrastructure (Roads, Electricity, Potable Water)

Lack of Qualified Health Professionals (Especially in Remote Areas)

Lack of Governance

Figure 3 Pays qui connaissent une pénurie aiguë de prestateurs de services (médecins, infirmières et sages-femmes)



Source des données : Organisation mondiale de la Santé. *Global Atlas of the Health Workforce* (http://www.who.int/globalatlas/default.asp).

Context

- Unequal distribution of health professionals in Sub-Saharan African countries

- For example in Mali :
  - 95% of specialists are concentrated in the capital city
  - Only one radiologist in remote areas of the country (Public sector)
  - No cardiologist in most areas
  - Populations whose vulnerable groups must travel hundreds of kiolometers to access specialized care and services

- Telemedicine ???

Universal Health Coverage and AI

- Universal Health Coverage
  - Equal access to healthcare
  - Financial access to health
  - Quality of health services

- Question is how to get to this Universal Health Coverage ?
  - Train more qualified health workers?
  - Equip more health structures irght up to remote area ?
  - Bet on innovations of use in health ?
    - Télémédecine
    - Artficial intelligence

Use Case : AI and Telemedicine in the Fight Against Diabetic Retinopathiy in Senegal

- Project for Equal Access to Ophthalmolgists : Senegal MoH, ITI, WHO

- Goals
  - Timely detect and manage diabetic retinopathy
  - Connect peripheral health centers to specialists
    - Telemedicine and AI

- Tools :
  - «Bogou» tele-expertise platform
  - AI platform

« Support health professionals where they are most needed»

Applications and activities

- **All health field**
  - Obstetric Imaging
  - Mother's and child's health
  - Cardiology
  - Diabelogy
  - Dermatology
  - Internal Medicine
  - Non Communicable Diseases

- 68 user groups (virtual community of practice) in 15 countries on 4 continents
- Institutions: WHO, Red Cross, 2nd Chance etc.
- Hundreds of users
- All professionnal categories
- 4 languages
- Thousands of cases

Interface Bogou- AI

Bogou - Rétinographie - Version 1.0 Déconnexion

Id	Date	Auteur	Patient	Statut
#7282	2020-11-05 13:51	SARR Lamine	A T	Effectuer un diagnostic par l'IA
#7283	2020-11-05 14:01	SARR Lamine	F C	Effectuer un diagnostic par l'IA
#7285	2020-11-05 14:14	SARR Lamine	H Th	Effectuer un diagnostic par l'IA

Case #7286
Subject: CDH PMS
Patient: F S - 63 ans - female

Effectuer un diagnostic par l'IA

2020-11-05 14:20 - SARR Lamine

Patiente de 63 ans suivi pour Diabète type 2

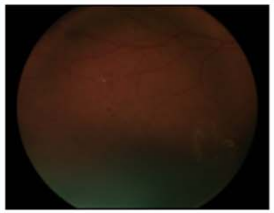
2020-11-07 06:27 - SAMRA Audrey

Retinopathie diabetique non proliferante severe avec maculopathie.

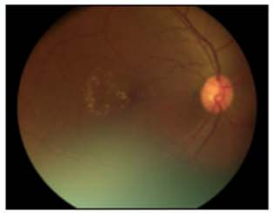
2020-11-07 06:28 - SAMRA Audrey

Si possible référer patient pour prise en charge

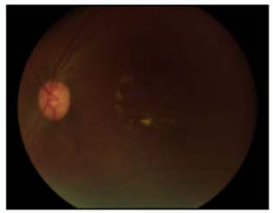
IM0017EY.JPG
Pas d'examen...
Pas de diagnostic



OD0014EY.JPG
Pas d'examen...
Pas de diagnostic



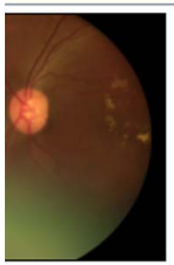
OS0015EY.JPG
Pas d'examen...
Pas de diagnostic



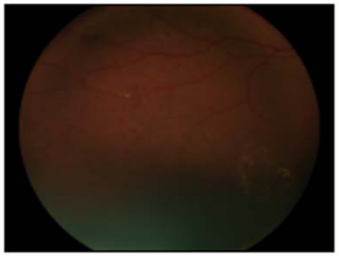
OS0016EY.JPG
Pas d'examen...
Pas de diagnostic

Effectuer un diagnostic par l'IA

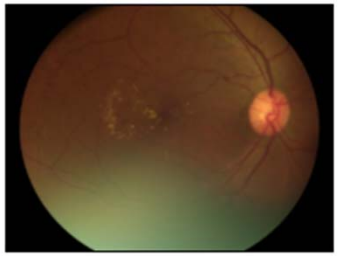
#7287	2020-11-05 14:24	SARR Lamine	D TH	Effectuer un diagnostic par l'IA
#7288	2020-11-05 14:29	SARR Lamine	A G	Effectuer un diagnostic par l'IA
#7289	2020-11-05 14:32	SARR Lamine	Bineta BA	Effectuer un diagnostic par l'IA



EY.JPG
...
agnostic



OD0014EY.JPG
Pas d'examen...
Pas de diagnostic



OS0015EY.JPG
Pas d'examen...
Pas d'examen...
Oeil gauche centrale
Oeil gauche latérale
Oeil droit centrale
Oeil droit latérale

Effectuer un diagnostic par l'IA

.-05 14:24 SARR Lamine D TH E

Case #7286
Subject: CDH PMS
Patient: F S - 63 ans - female

Evaluer le diagnostic de l'IA

2020-11-05 14:20 - SARR Lamine

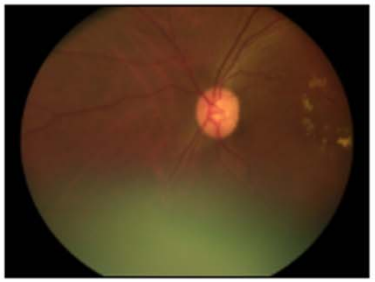
Patiente de 63 ans suivi pour Diabète type 2

2020-11-07 06:27 - SAMRA Audrey

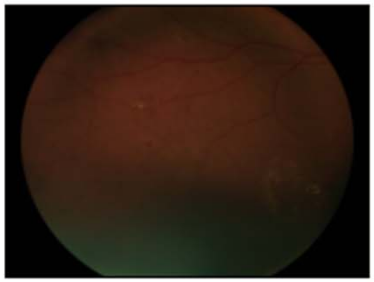
Retinopathie diabetique non proliferante severe avec maculopathie.

2020-11-07 06:28 - SAMRA Audrey

Si possible référer patient pour prise en charge

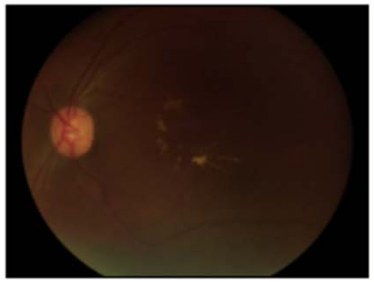


IM0017EY.JPG
Pas d'examen...
Pas de diagnostic



OD0014EY.JPG
Pas d'examen...
Pas de diagnostic

OS0015EY.JPG
Oeil droit centrale
Moderate NPDR

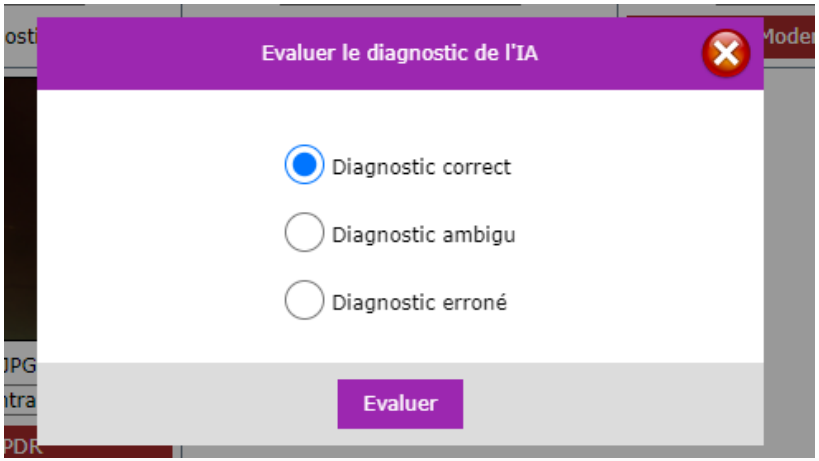


OS0016EY.JPG
Oeil gauche centrale
Moderate NPDR

Effectuer un diagnostic par l'IA

Evaluer le diagnostic de l'IA

Evaluation AI



Id	Date	Auteur	Patient	Statut
#7282	2020-11-05 13:51	SARR Lamine	A T	Effectuer un diagnostic par l'IA
#7283	2020-11-05 14:01	SARR Lamine	F C	Effectuer un diagnostic par l'IA
#7285	2020-11-05 14:14	SARR Lamine	H Th	Evaluer le diagnostic de l'IA
#7286	2020-11-05 14:20	SARR Lamine	F S	Diagnostic correct
#7287	2020-11-05 14:24	SARR Lamine	D TH	Diagnostic erroné
#7288	2020-11-05 14:29	SARR Lamine	A G	Diagnostic ambigu
#7289	2020-11-05 14:32	SARR Lamine	Bineta BA	Effectuer un diagnostic par l'IA
#7291	2020-11-05 14:41	SARR Lamine	F S K	Effectuer un diagnostic par l'IA

AI Contributions for Universal Health Coverage

- Facilitate Inclusiveness and Scale-up
  - Reduce dependence on remonte experts
  - Increase number of users and beneficiaries

- Improve the Quality of Care
  - Decision support for health professionals
  - With little or no wainting times, eg : teleexpertise use case

- Reduce the Cost of Care
  - Cost related to the organizational aspects
  - Patient care costs

Conclusion

- AI is an asset for Universal Health Coverage
- Many challenges still remain and have to be tackled
- Data :
  - Production
  - Management
  - Nature
- Process of validation and algorithms
- Regulation
- Cost of artificial intelligence platforms
- Technical infrastructure

Questions ?
cobagayoko@certesmali.org

For more info, contact:

Prof. Cheick Oumar BAGAYOKO– cobagayoko@certesmali.org