VIRTUAL HEALTH HUB

# THE VIRTUAL HEALTH HUB AND THE FUTURE OF HEALTHCARE

Ivar Mendez, MD, PhD. FRCSC, FACS, FCAHS, OC

Government of Canada / Gouvernement du Canada
Canada

Government of Saskatchewan

University of Saskatchewan

SIIT

Wapaha Ska Dakota Oyate
Whitecap Dakota Nation

Saskatchewan Health Authority

SHRF Saskatchewan Health Research Foundation

CIHR IRSC
Canadian Institutes of Health Research / Instituts de recherche en santé du Canada

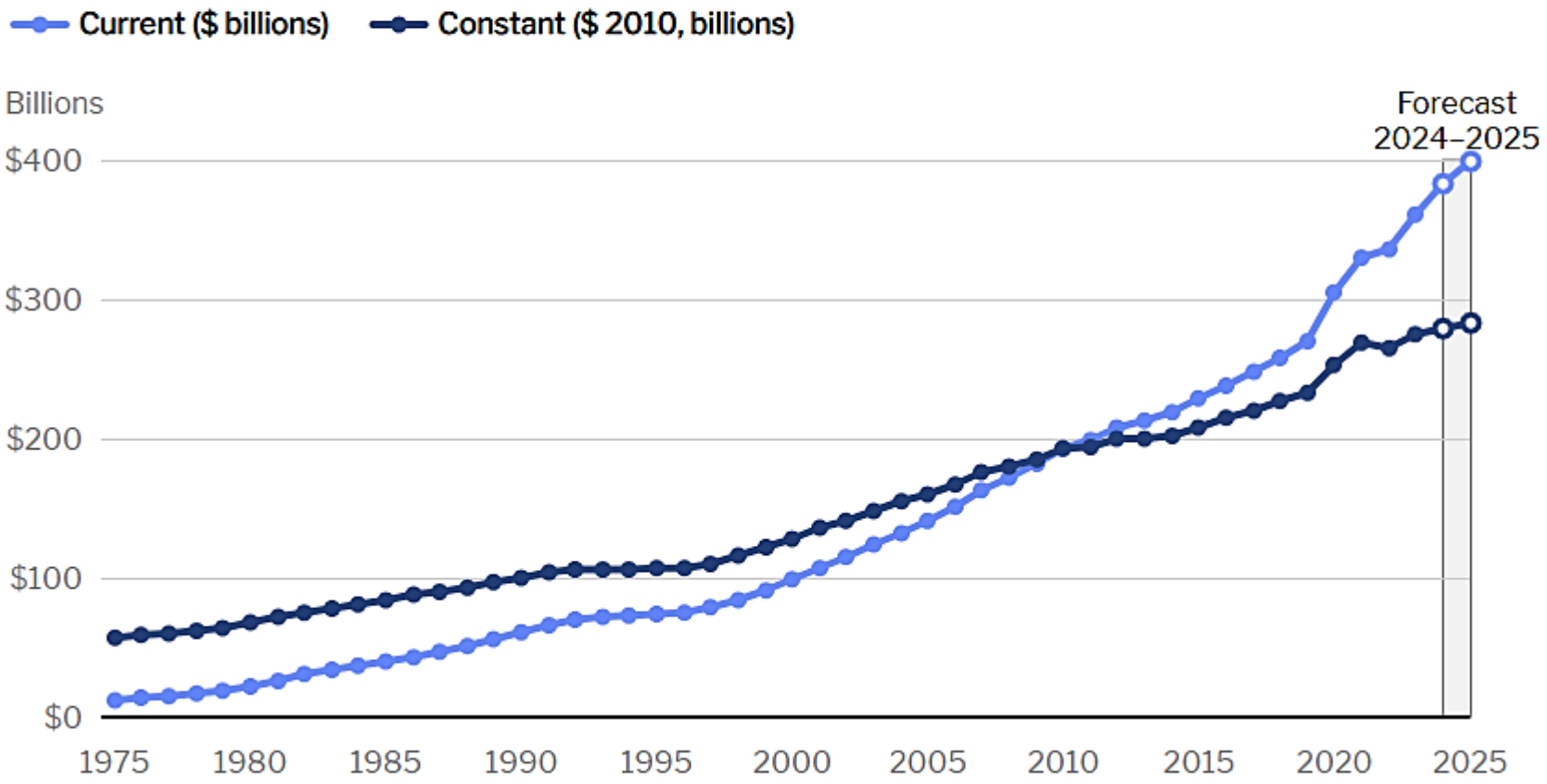
# ACCESS TO HEALTH CARE

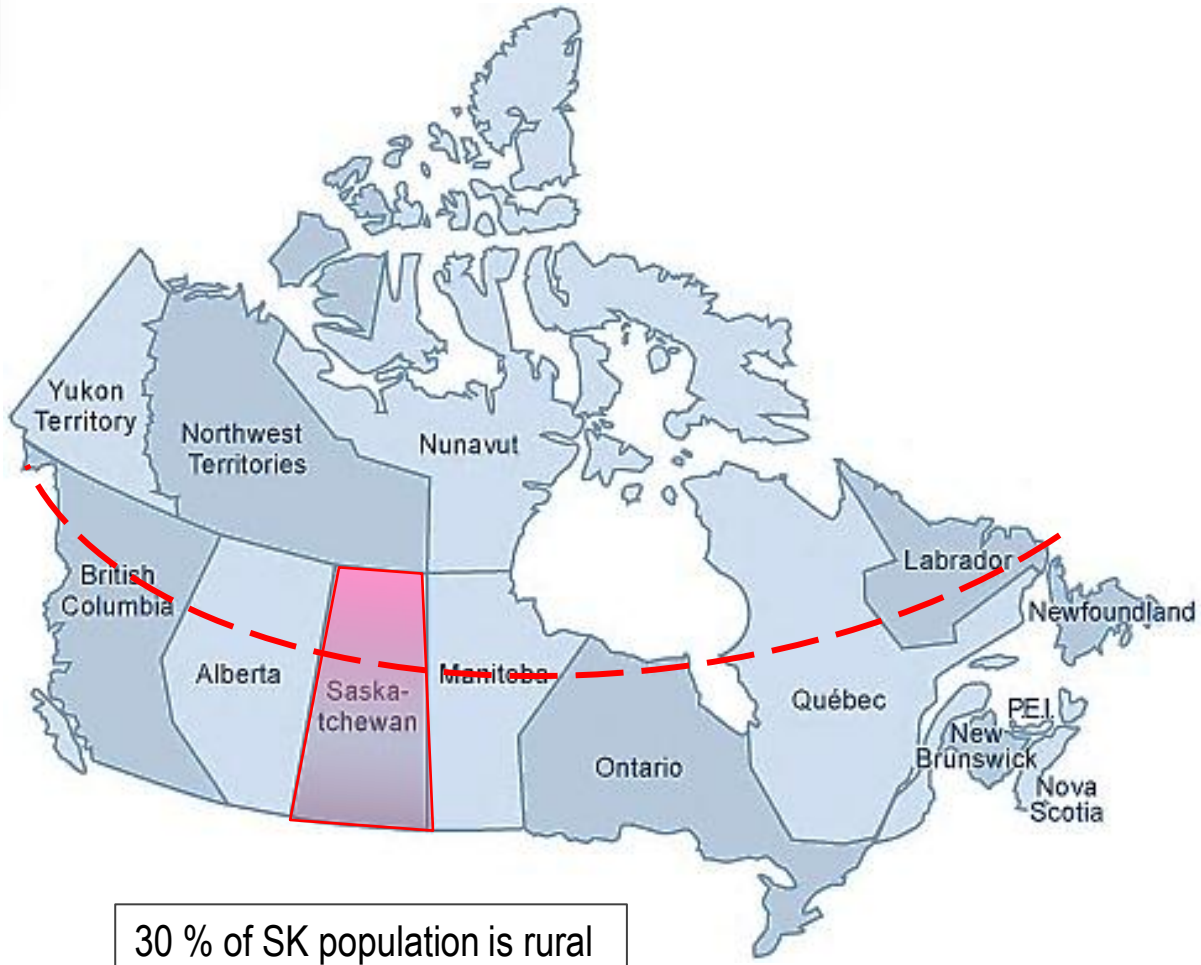
Canadian Institute for Health Information
Institut canadien d'information sur la santé

CANADA

# Health care spending is expected to reach $399 billion in 2025

Options






30 % of SK population is rural

Indigenous Services Canada | Services aux Autochtones Canada

| Region | 2023 to 2024 |
|---|---|
| Atlantic | $18,294 |
| Quebec | $28,596 |
| Ontario | $166,036 |
| Manitoba | $261,374 |
| Saskatchewan | $115,915 |
| Alberta | $69,508 |
| North | $129,898 |
| Total | **$789,621** |





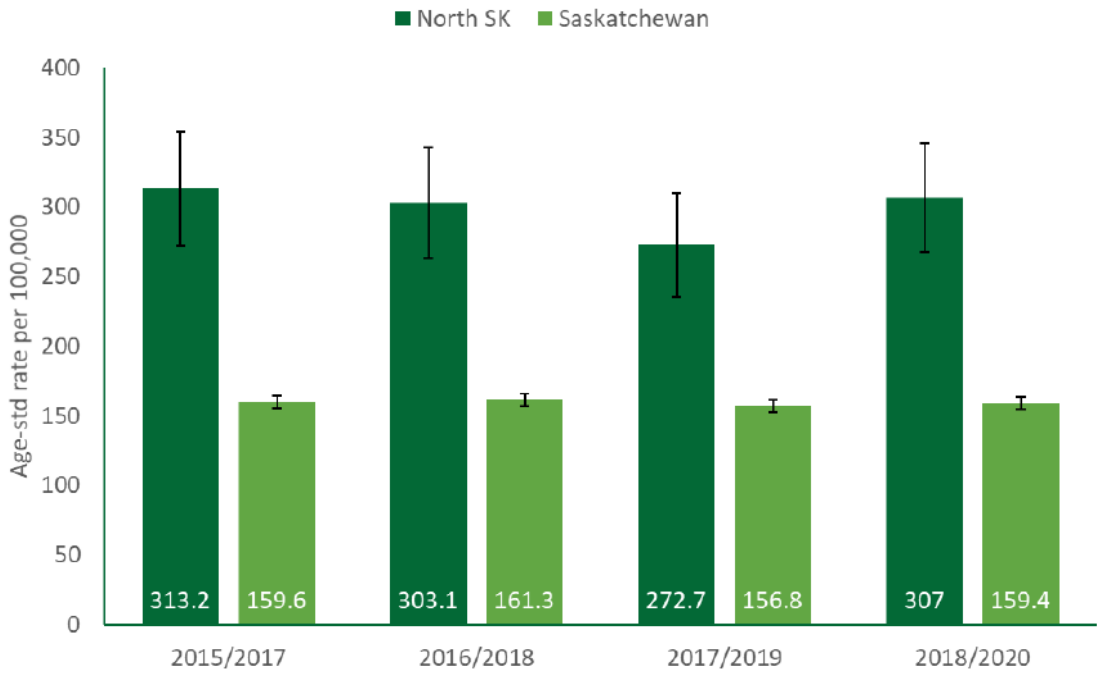


Indigenous Population in Saskatchewan: **187, 885**

**Total expenditures ( $ 000's)**

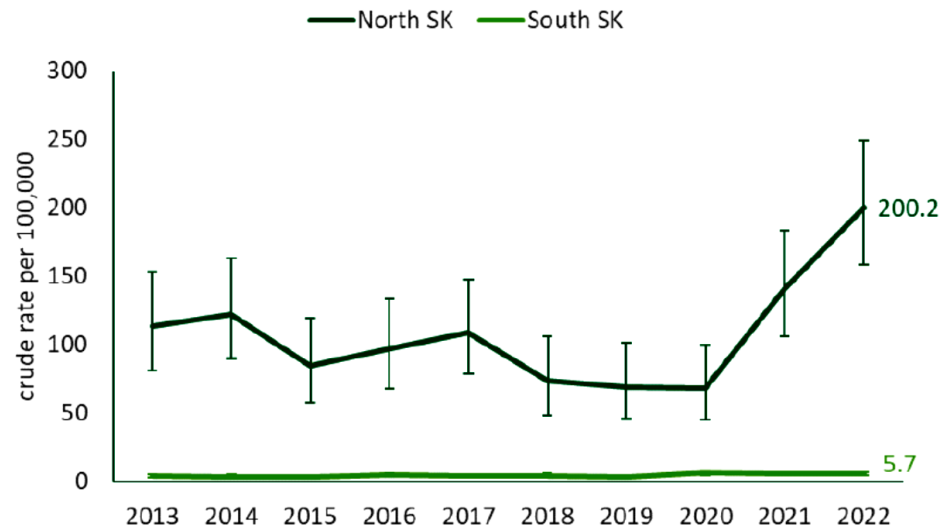
POPULATION HEALTH UNIT
Northern Saskatchewan

**Figure 21: Age-std preventable mortality, 3 year average, northern Saskatchewan and Saskatchewan, 2015-2017 to 2018-2020**




## Tuberculosis

**Figure 20: Crude Tuberculosis rate, northern and southern Saskatchewan, on and off-reserve, 2013-2022**






Khan et al., Canadian Communicable Disease Report, 2017

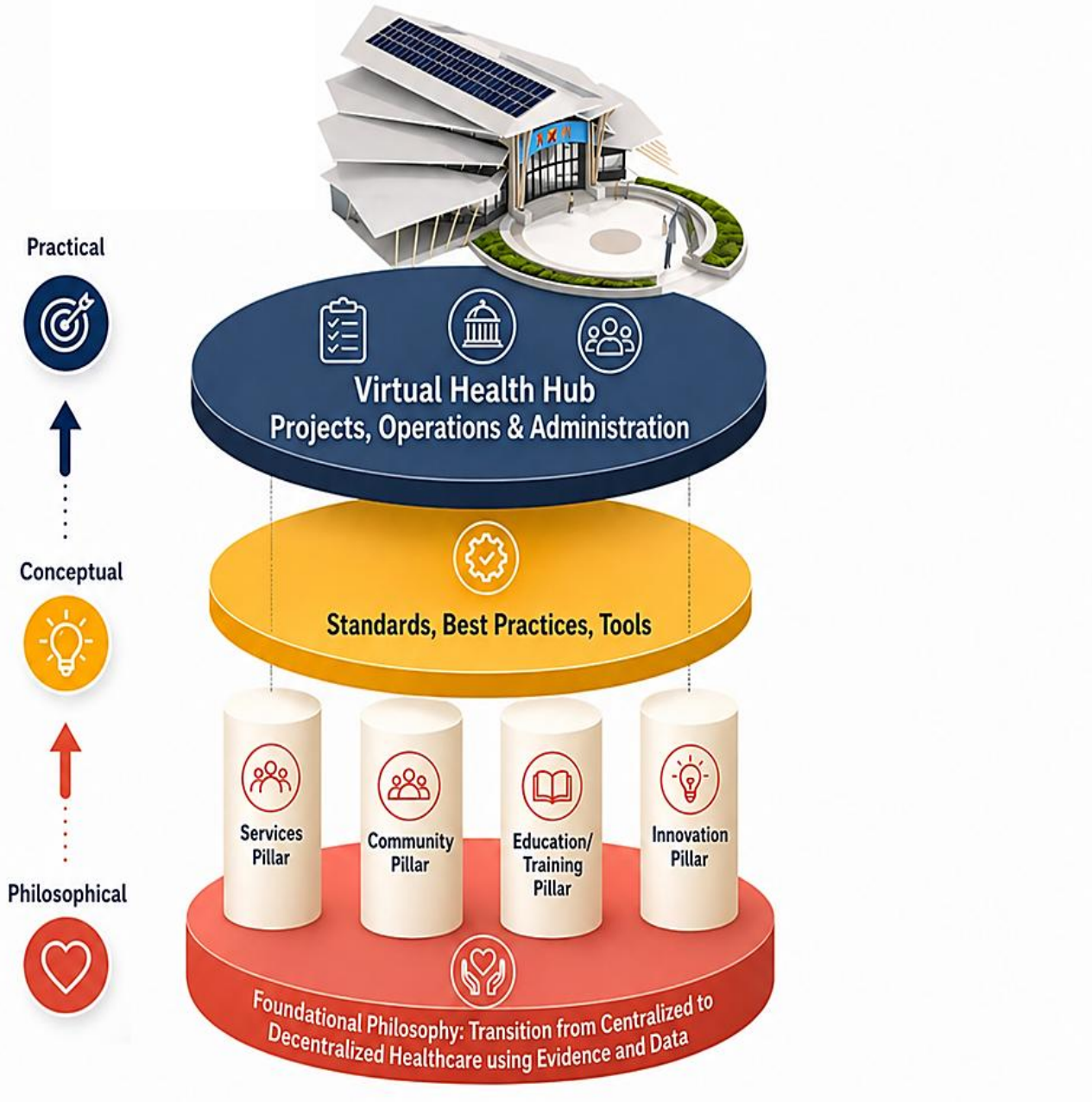
# A Blueprint for Scalable Virtual Care

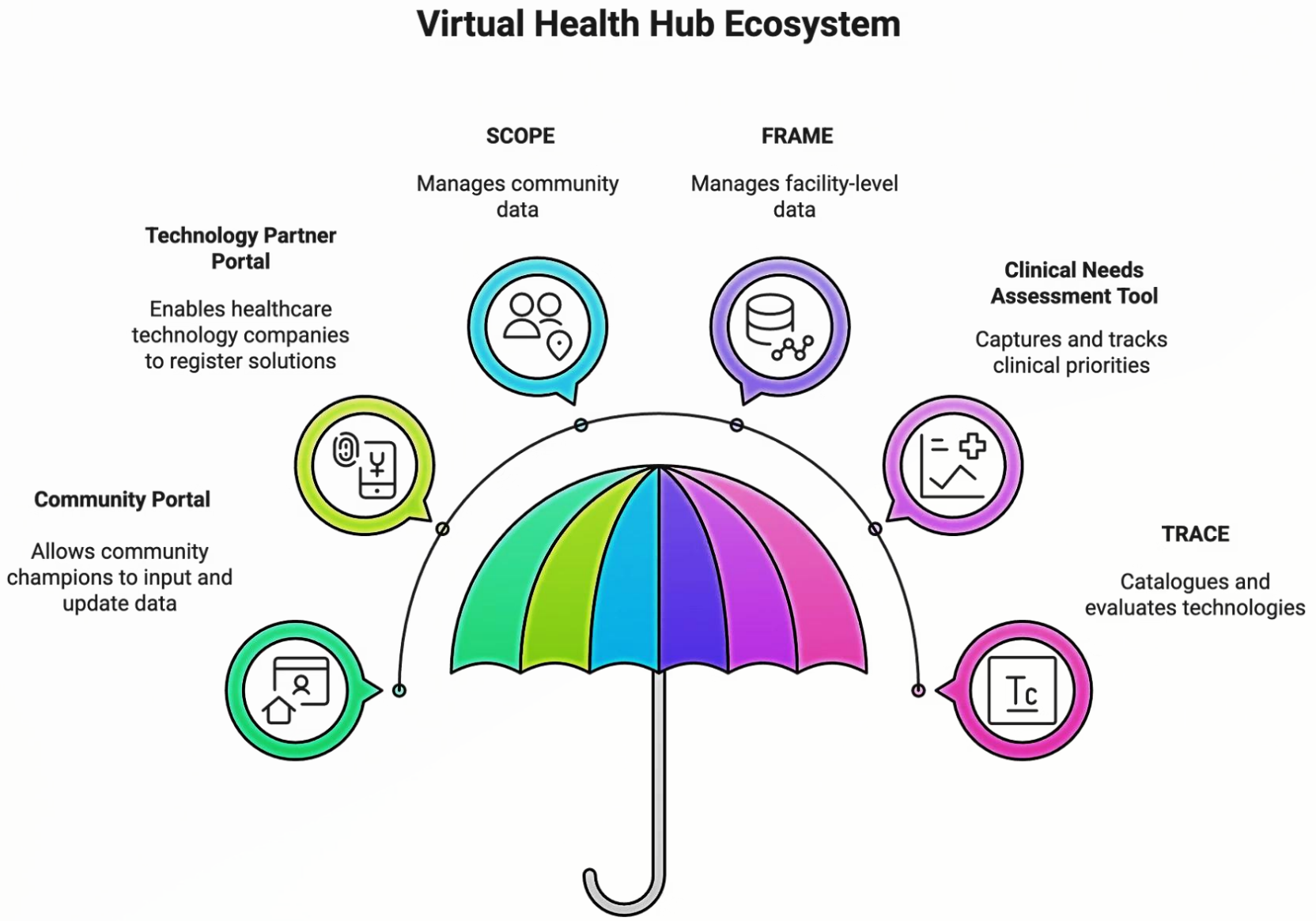
VIRTUAL HEALTH HUB

Government of Saskatchewan

Government of Canada / Gouvernement du Canada

Canada






A modular suite of **AI** tools designed to support the **planning, implementation, and scaling** of virtual care in a **systematic, evidence-based, and data-driven** way.

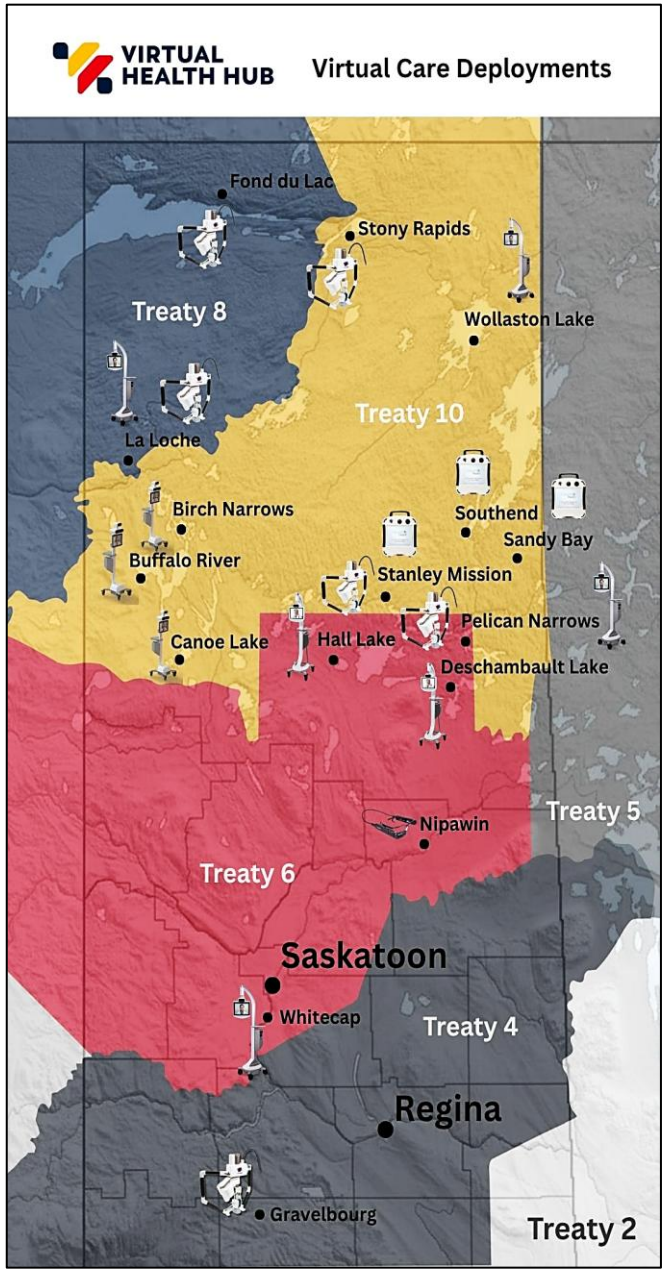
Deason et al., Journal of Telemedicine and Telecare. 2024

VIRTUAL HEALTH HUB

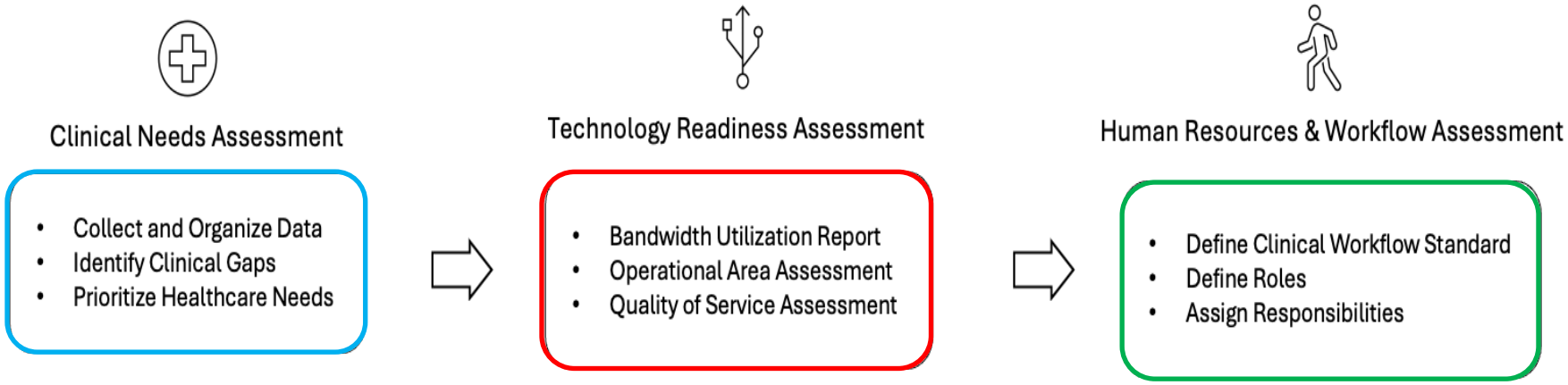
# Site Qualifying Checklist



A step-by-step guide to comprehensively assessing candidate health centers for the provision of new virtual care services.




Deason et al., Journal of Telemedicine and Telecare. 2024




. Three domains of the tool

Deason et al., Journal of Telemedicine and Telecare. 2024

# REMOTE ACUTE PEDIATRIC CARE








Holt et al., Telemedicine and e Health, 2018

REMOTE ACUTE PEDIATRIC CARE

| | Robot Intervention | Control | p value |
|---|---|---|---|
| **Transported** | 14/38 (37%) | 31/31 (100%) | < 0.05 |
| **Mean length of stay non-transported (days)** | 0 | 4.9 | < 0.001 |
| **Regionalized** | 6/14 (42.8%) | 0/31 (0%) | < 0.05 |
| **Mean Ped-CTAS score** | 2.6 (1-4) | 2.3 (1-4) | 0.89 |

**CTAS**= Canadian Triage Assessment Score

Holt et al., Telemedicine and e Health, 2018

## COST EFFECTIVENESS

**Cost**

- RP-7i remote presence robot: ~$70,000 USD
- 1 specialized inter-facility transport: ~$10,000 USD

**Transports Prevented**

- 24/38 over 13-month study period

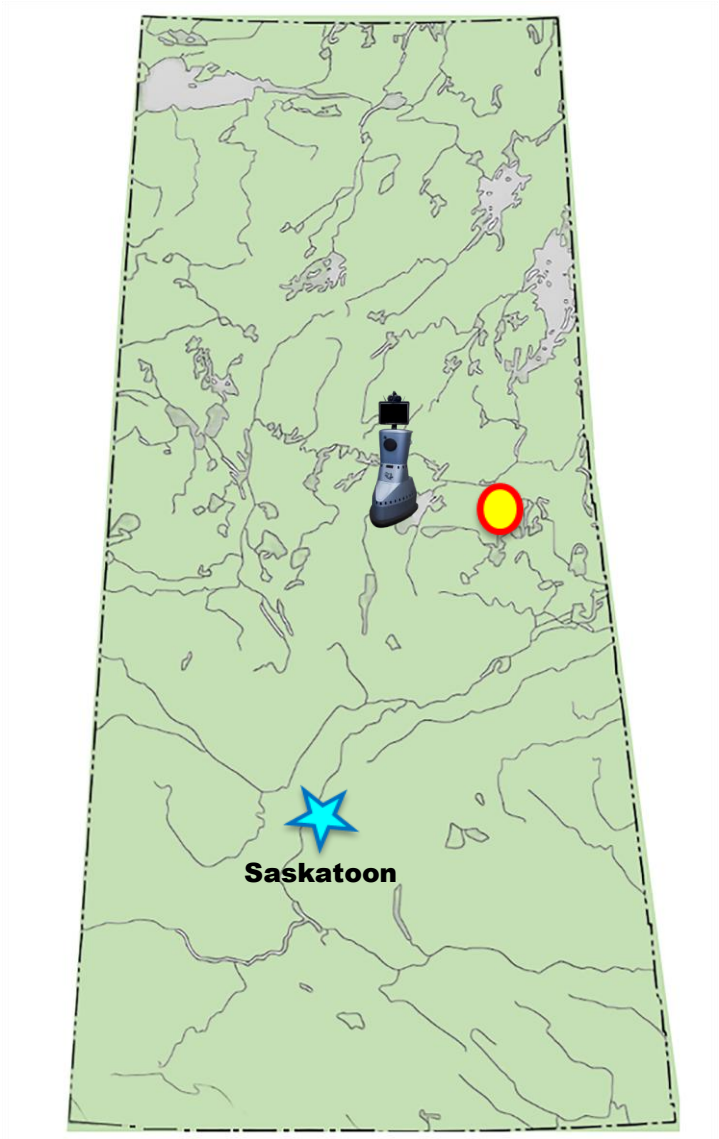
**Estimated Savings**

- Transport: $240,000 (24 x $10,000/transport)
- Hospital bed: $120,000 (24 x $1,000/day x 5 days)
- Total: $360,000

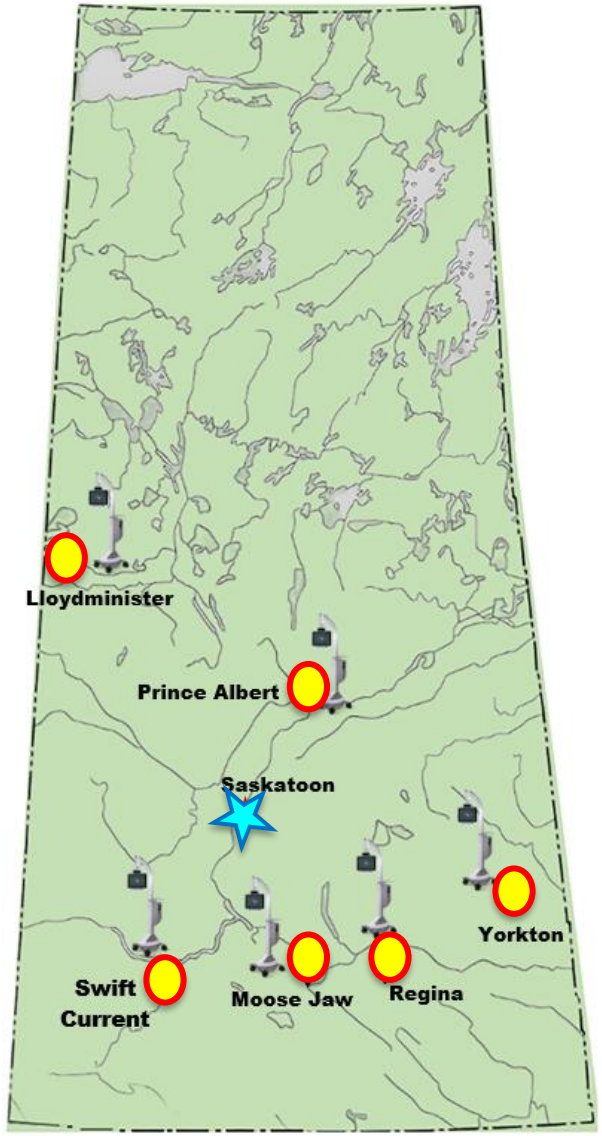
**Additional Savings**

- Family: travel, accommodations, meals, childcare
- Specialized pediatric transport team availability

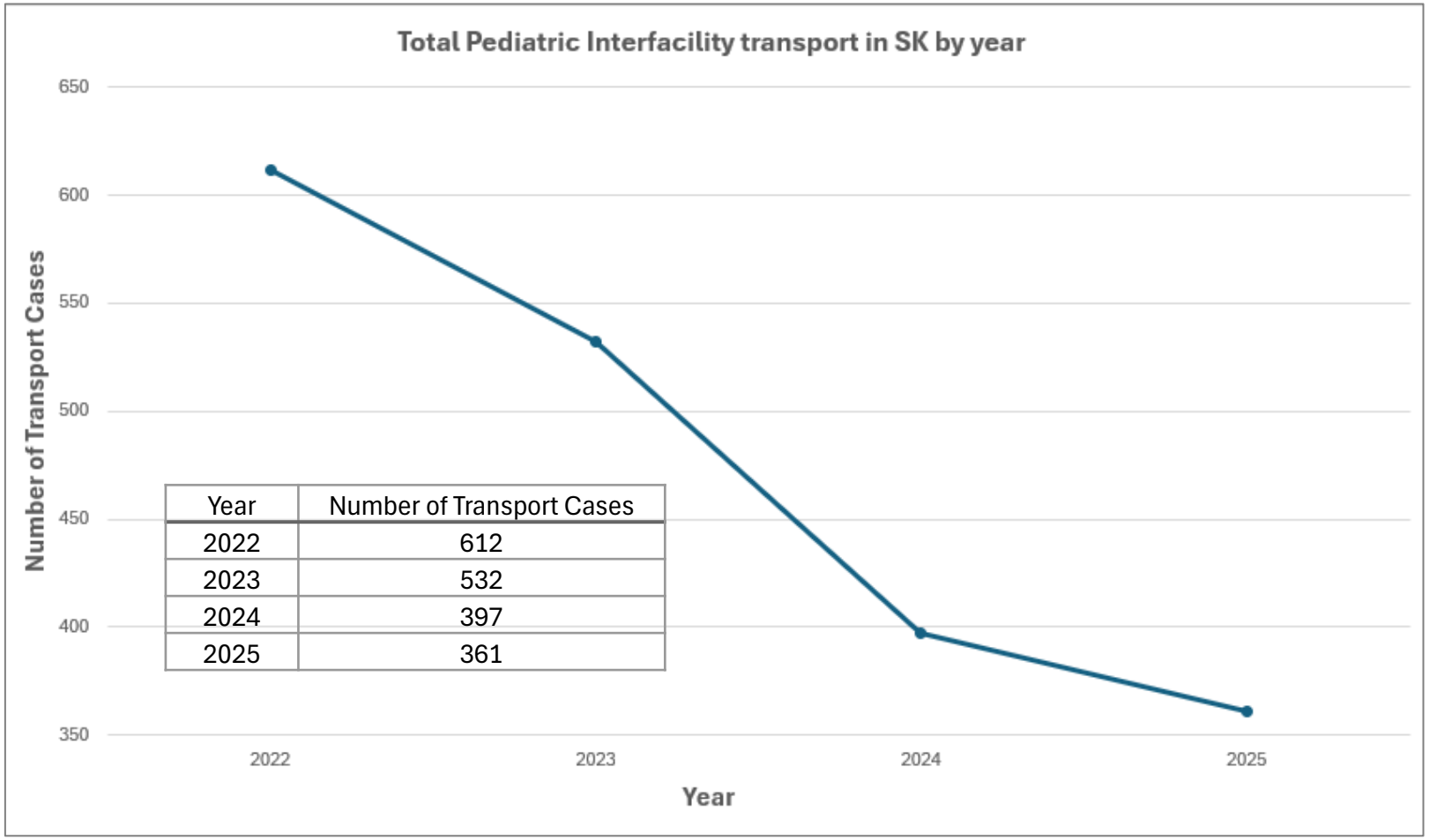
# ACUTE PEDIATRIC INTERFACILITY TRANSPORT IN SASKATCHEWAN




2015




2022



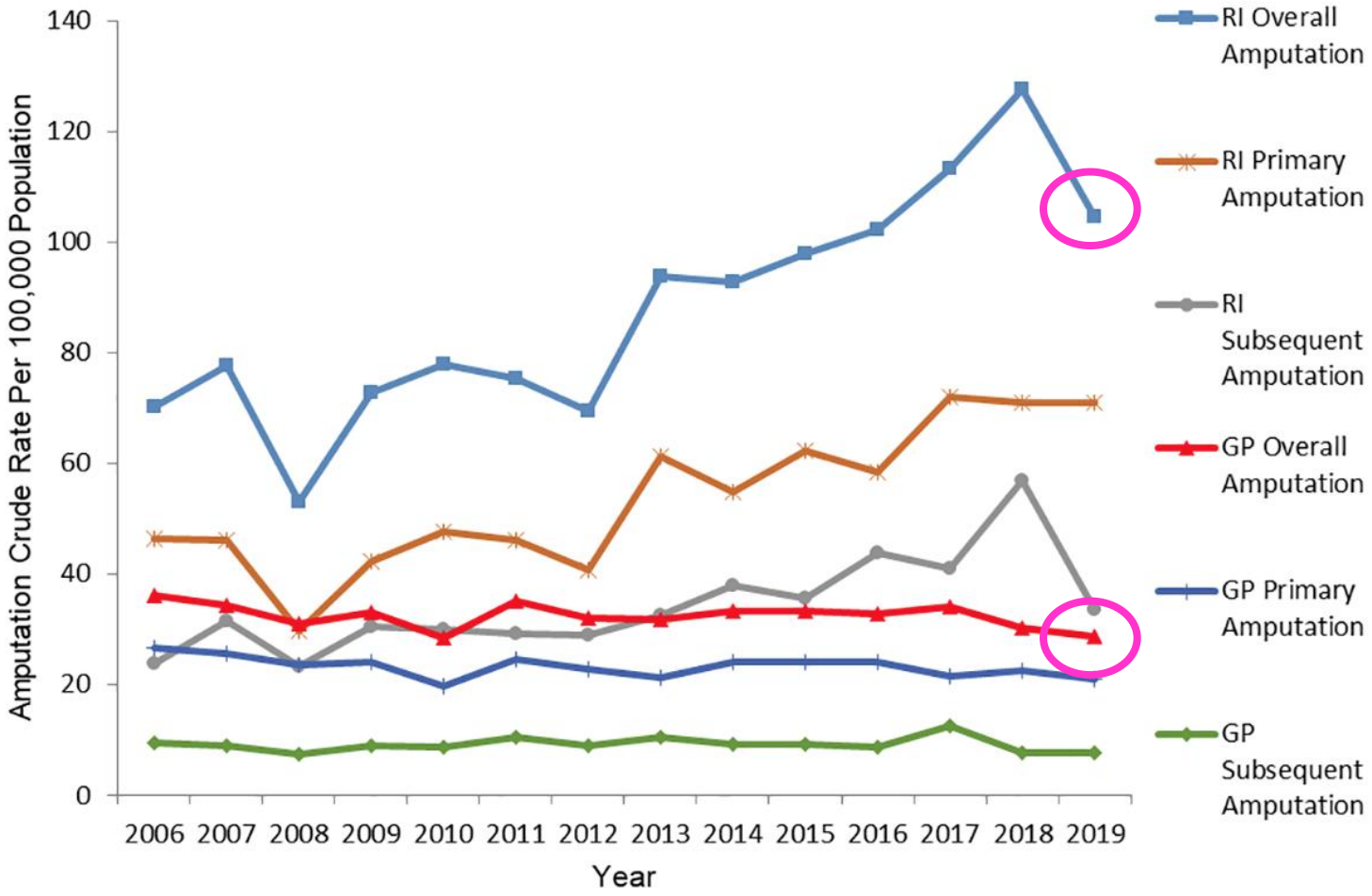

| Year | Number of Transport Cases |
|---|---|
| 2022 | 612 |
| 2023 | 532 |
| 2024 | 397 |
| 2025 | 361 |

41% reduction

# TARGETED DIGITAL SOLUTIONS

## RATES OF LOWER LIMB AMPUTATIONS IN INDIGENOUS POPULATIONS IN SASKATCHEWAN

76% Diabetes



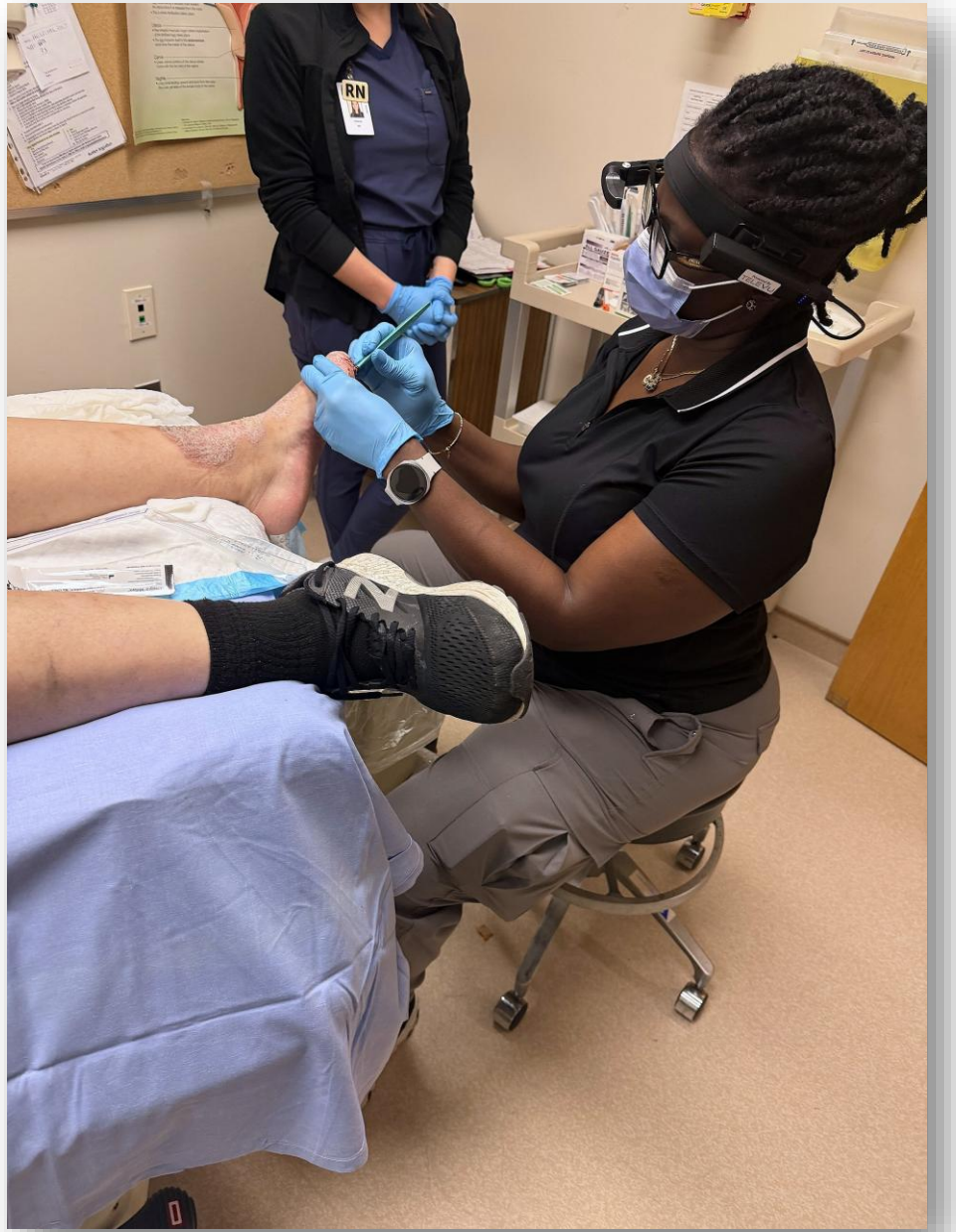

*Essien et.al, Arch Public Health* **80**, 10 (2022)

## WEARABLE VIRTUAL CARE TECHNOLOGY

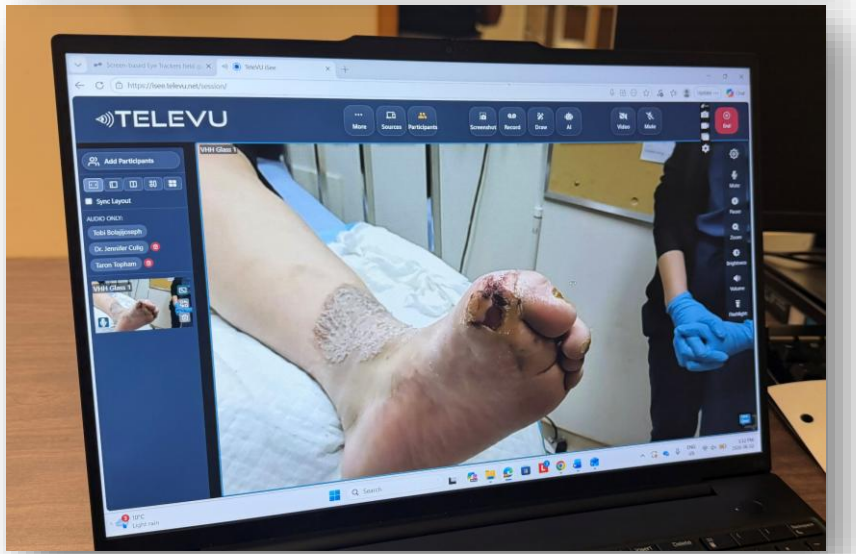






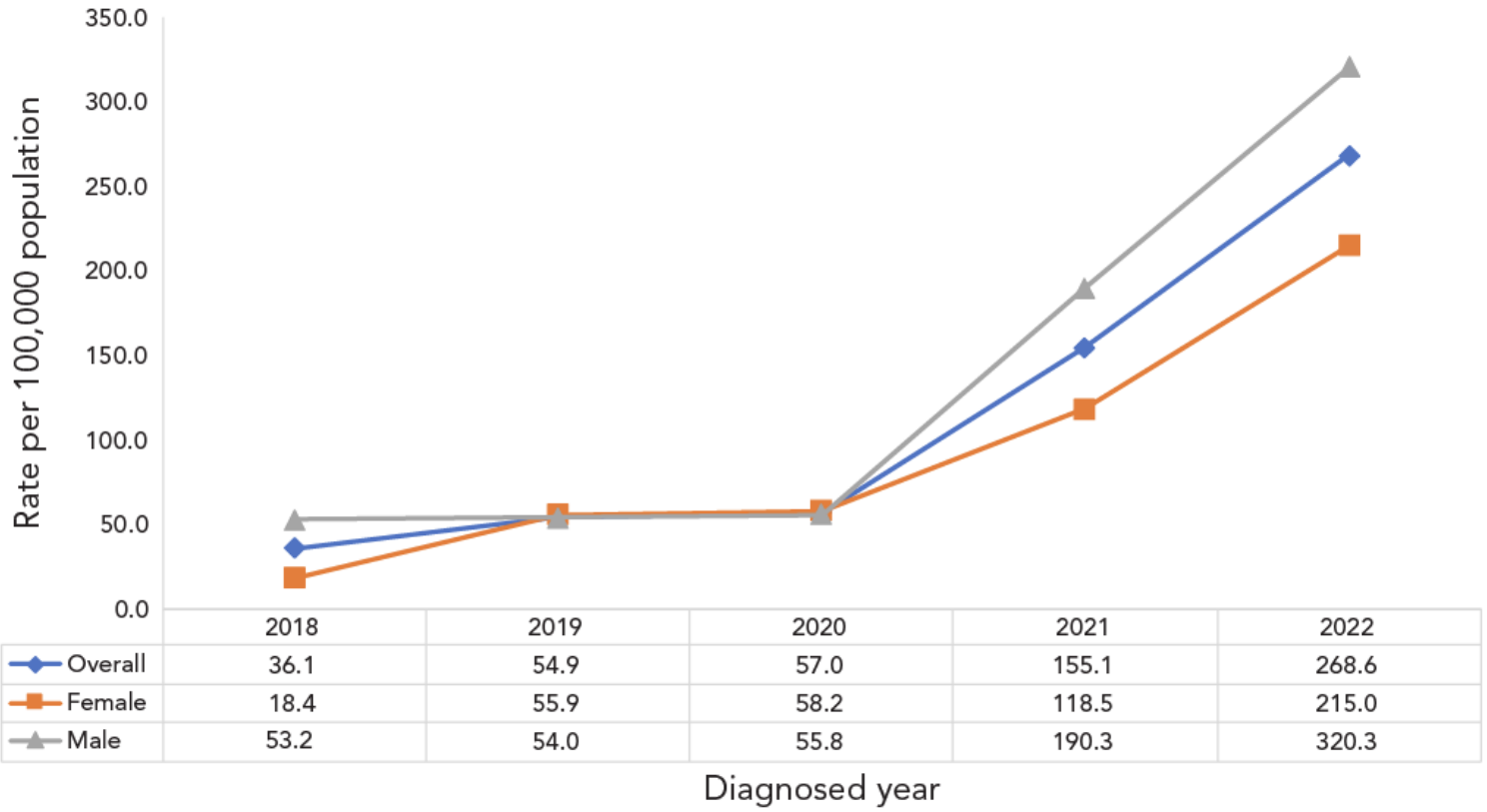


RN


TELEVU


TELEVU
More
Sources
Participants
Screenshot
Record
Draw
AI
Video
Mute
Add Participants
Sync Layout
AUDIO ONLY:
Tobi Bolajoseph
Dr. Jennifer Culig
Saron Tapharn

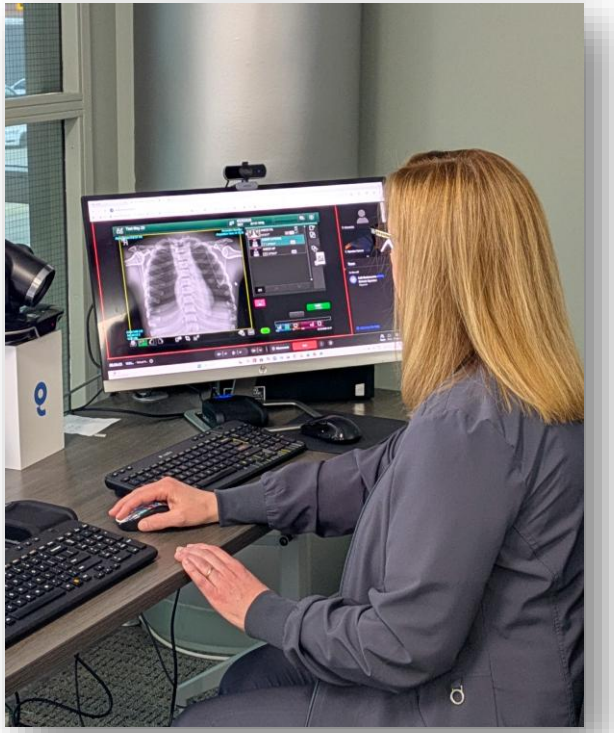



## Active paediatric tuberculosis incidence by sex in Northern Saskatchewan First Nations on-reserve communities, 2018–2022




| | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|
| Overall | 36.1 | 54.9 | 57.0 | 155.1 | 268.6 |
| Female | 18.4 | 55.9 | 58.2 | 118.5 | 215.0 |
| Male | 53.2 | 54.0 | 55.8 | 190.3 | 320.3 |

Ndubuka, et al., CCDR, 2024



X-RAY CONTROL STATION

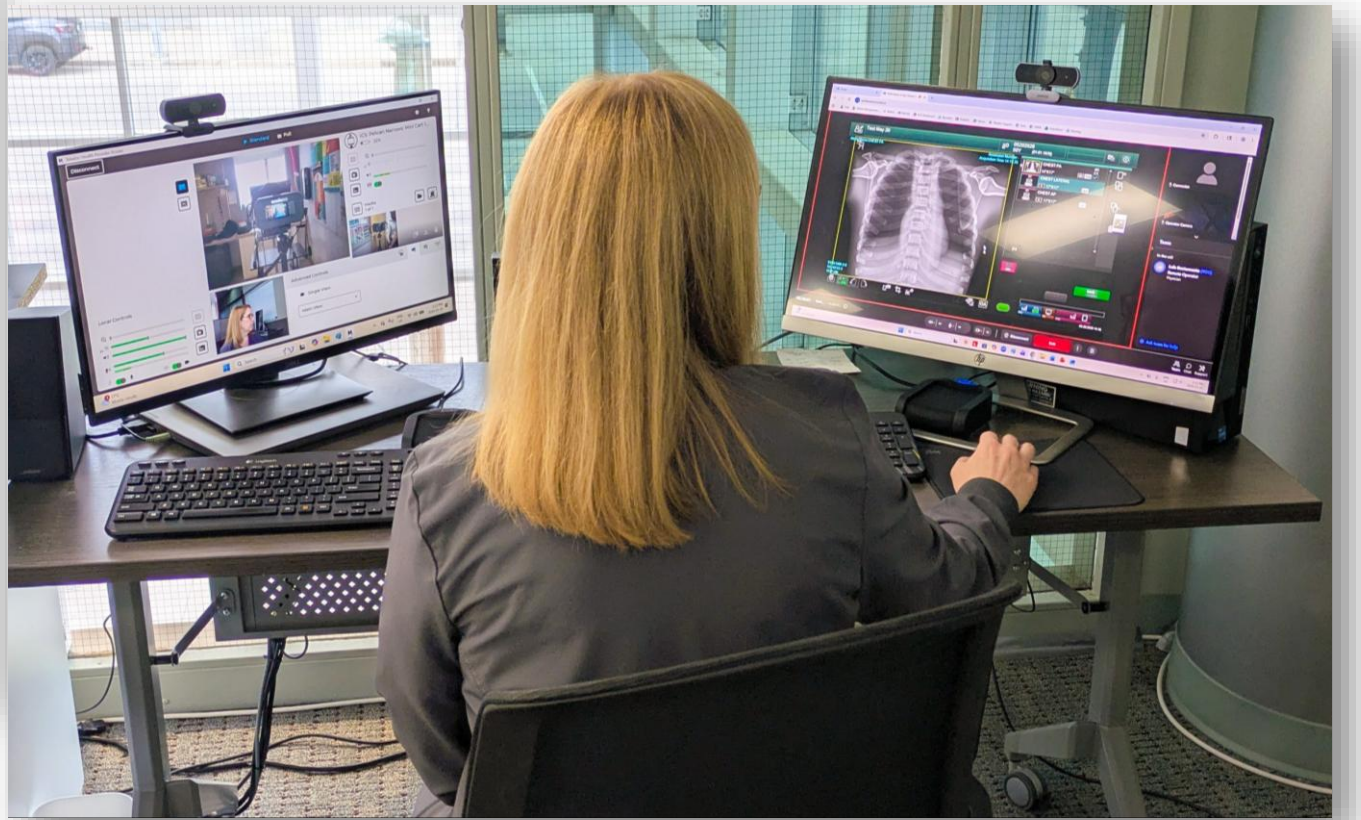



ROCLUB

REMOTE DIGITAL X-RAY



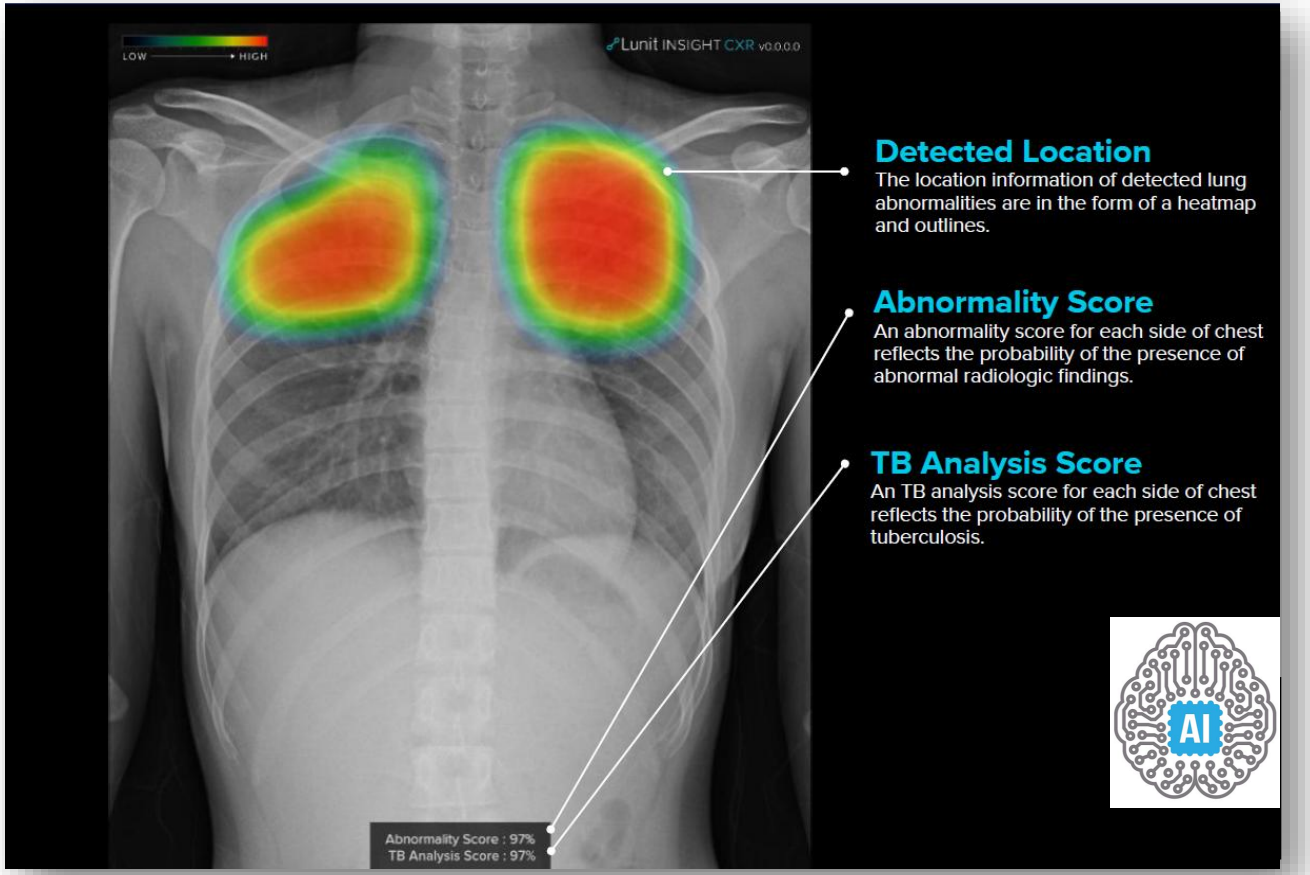

PEDIATRIC PT: PHYSIO FOR KIDS!
WHAT IS PT?
WHAT DO WE DO?
WE HELP KIDS AND FAMILIES PARTICIPATE IN THE ACTIVITIES THAT ARE IMPORTANT TO THEM!
2019
ANATOMY



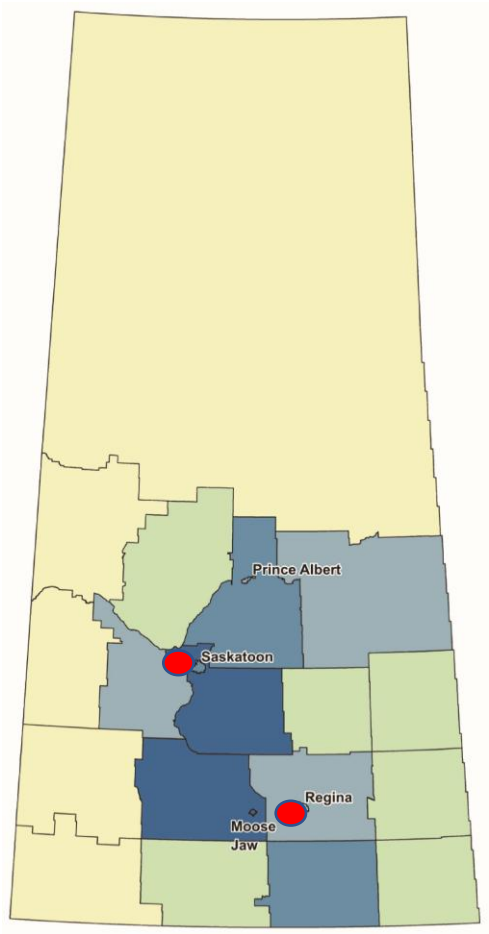
# Remotely Operated Digital CXR for TB







# Disparities In Obstetrical Ultrasound Utilization In Saskatchewan




2014-2018 Pregnancies/2nd trimester U/S in Saskatchewan

N= 80,536

Patients Less Likely To Have A Second Trimester Obstetrical Ultrasound:

- **Status First Nations individuals**

  **50%** less likely than non-status First Nations

- **Living in a rural area**

  **30%** less likely than those living in an urban area

- **Living in a more remote area (higher index of remoteness)**

Women in the most remote areas were **65%** less likely than those living in an urban area

Adams SJ et al. *Acad Radiol, 2021*

TELEROBOTIC ULTRASOUND

## Sonographer-site
## (Central Site)

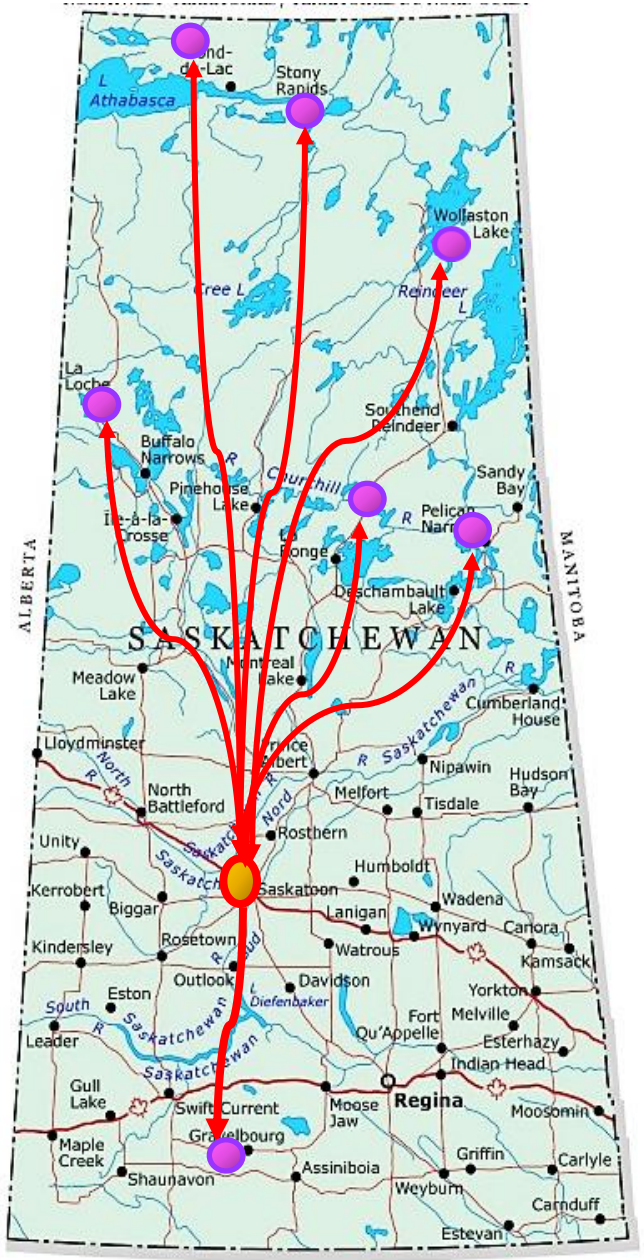




## Patient-site
## (Remote Clinic)



Adams, et al, Canadian Association of Radiologist Journal, 2017



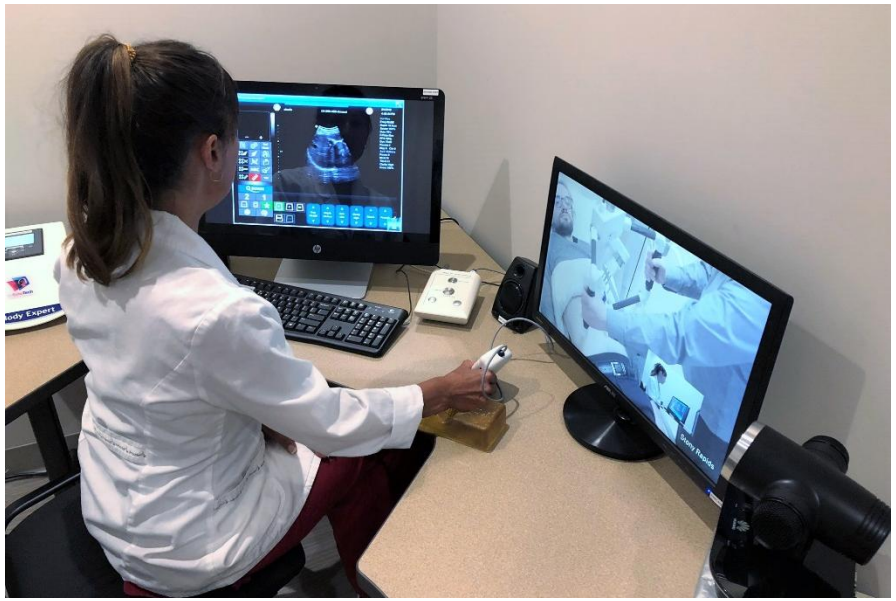




La Loche



Stony Rapids



Saskatoon

**97 %**

**Patient Satisfaction**

Adams, et al, International Journal of Circumpolar Health, 2021


REMOTE PATIENT MONITORING / POSTOP CARE
REMOTE DIAGNOSTIC IMAGING
REMOTE CLINICAL ASSESSMENT
VIRTUAL HEALTH HUB
REMOTE PHARMACY / PHYSIO
EMERGENCY TRIAGE
REMOTE MENTAL HEALTH CARE

VIRTUAL HEALTH HUB







Government of Canada / Gouvernement du Canada

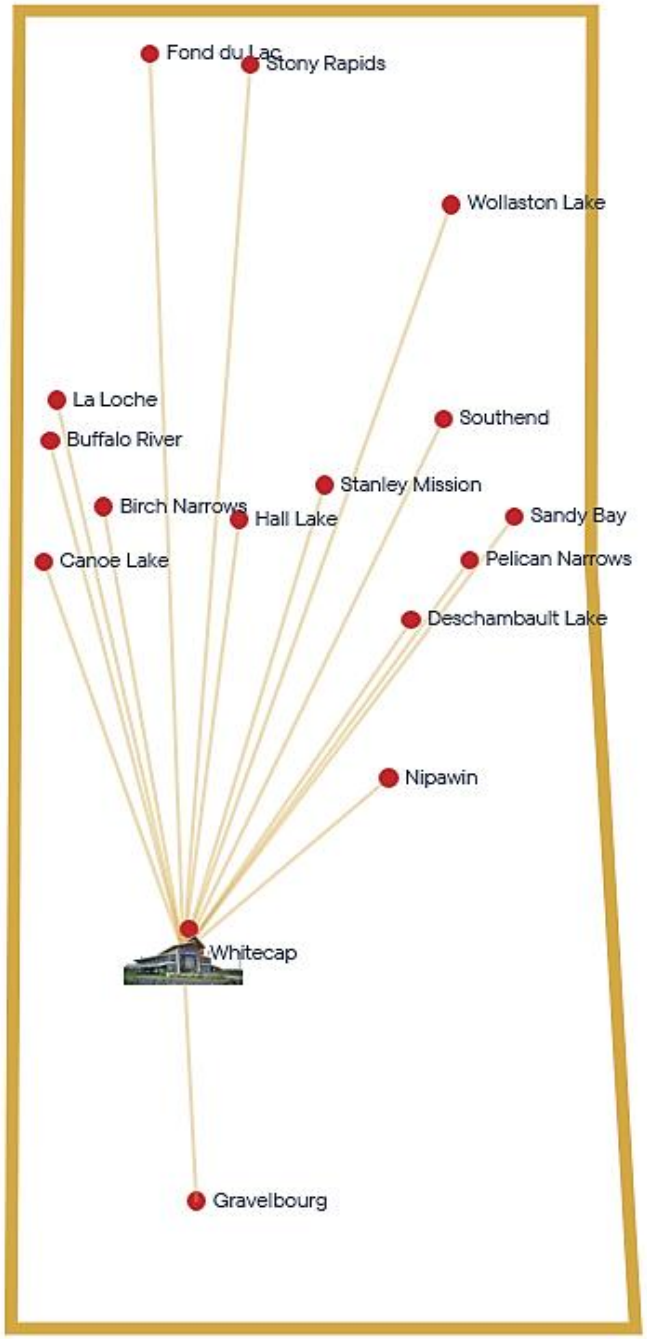
Canada

Government of Saskatchewan



VIRTUAL HEALTH HUB

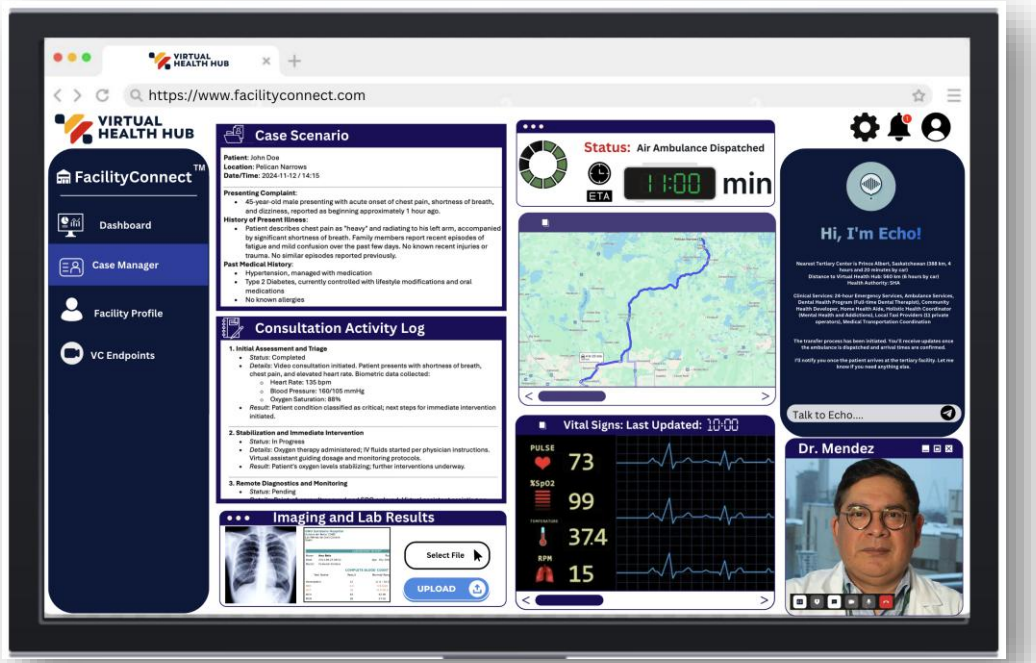
VHH VIRTUAL CARE ECOSYSTEM






CLINICIAN VIEWER

FACILITY CONNECT





# Command Center

- Case management
- Resource management
- Statistics and analytics
- Notification system
- Compliance and auditing

CIHR IRSC
Canadian Institutes of Health Research | Instituts de recherche en santé du Canada





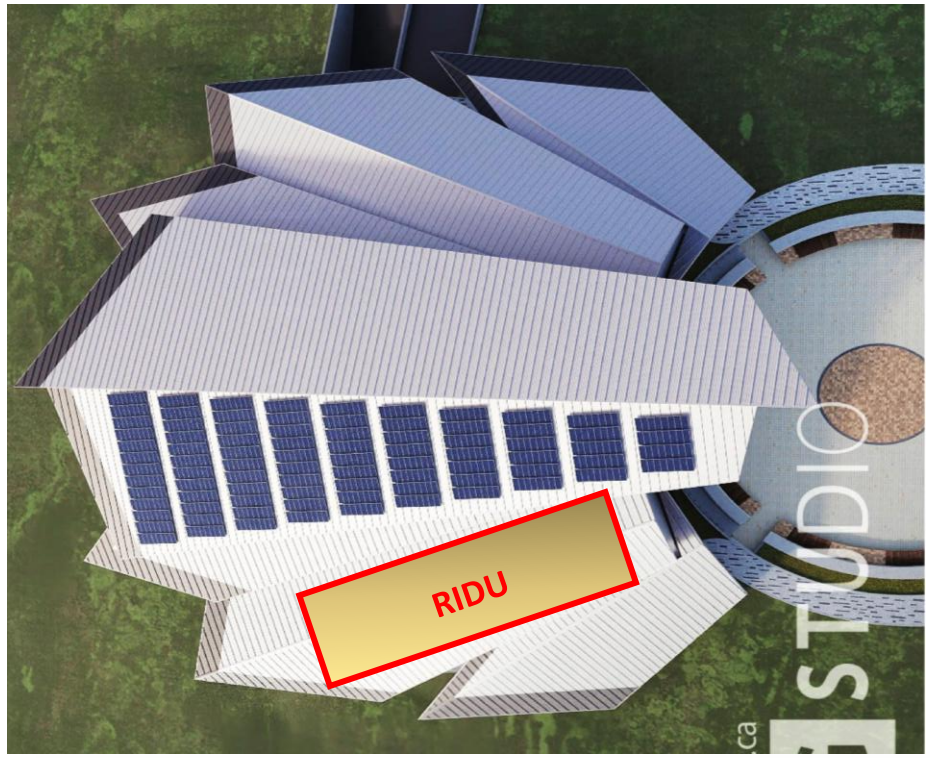






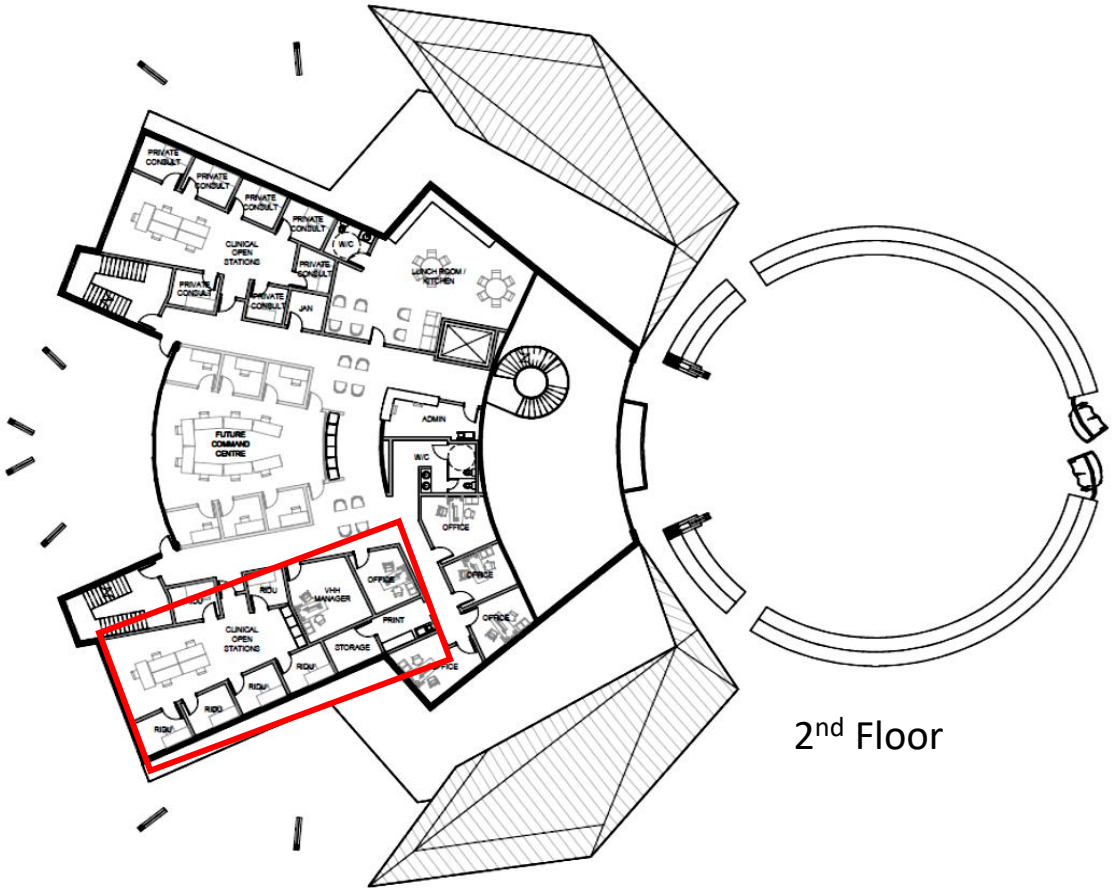







## Remote Imaging Diagnostic Unit (RIDU)




2nd Floor

VIRTUAL HEALTH CARE WORKFORCE TRAINING

# Virtual Health Care Technologist

Saskatchewan Indian Institute of Technologies

- PERFECTLY POSITIONED FOR VIRTUAL HEALTH TRAINING, ALREADY OFFERING:
  - Register Nurse Program
  - Indigenous Practical Nursing
  - Health Care Aid Program
  - Mental Health & Wellness
  - Paramedic Program
  - Radiology Technologists
  - Laboratory Technologists
  - IT Technologist
  - Robotic Technologists



# FIRST COHORT OF VIRTUAL HEALTHCARE TECHNOLOGISTS

**SEPTEMBER 2024**







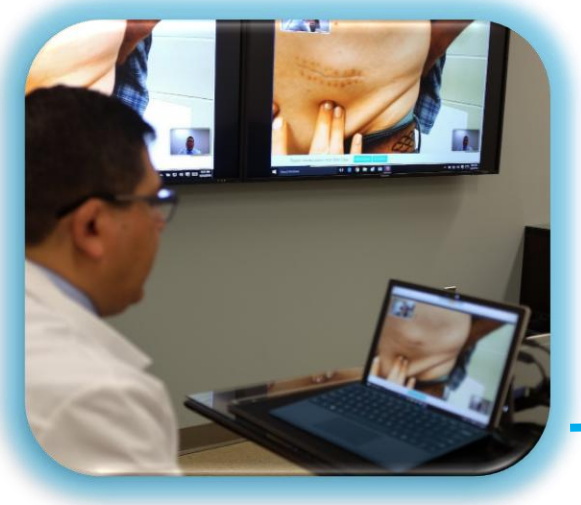
Home



Clinic

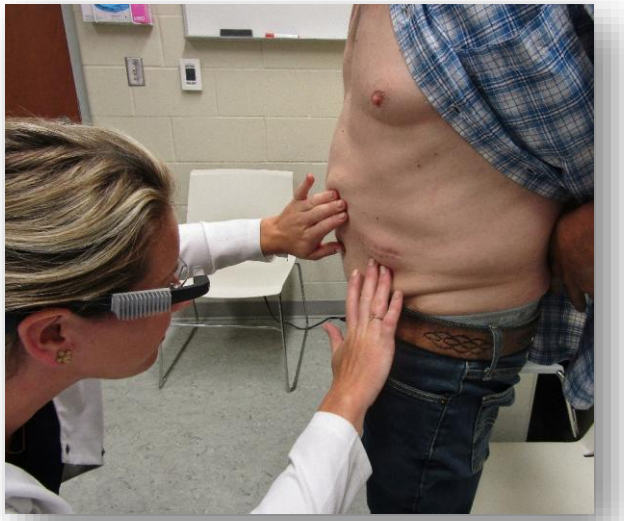


Home Hospital

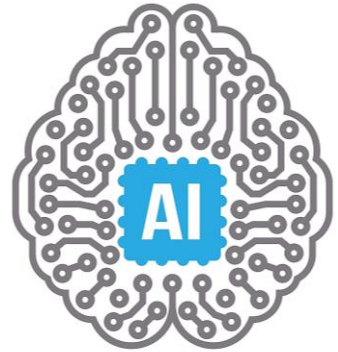











AI









