

Predicting resident deterioration through analytics

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Head of Aged and Disability – Telstra Health

A photograph of a female doctor in a white lab coat smiling and talking to an elderly female patient. The doctor is leaning in, and the patient is looking up at her. The background is softly blurred.

Who is Telstra Health?





**‘Improving
lives through
connected
healthcare’**



The power of data



Population Health

- **National Cancer Screening Register (NCSR)**
- **Commonwealth Government Initiative**

Enables a single electronic record for each person participating in cervical and bowel screening.

Helps improve cancer screening outcomes *linking*

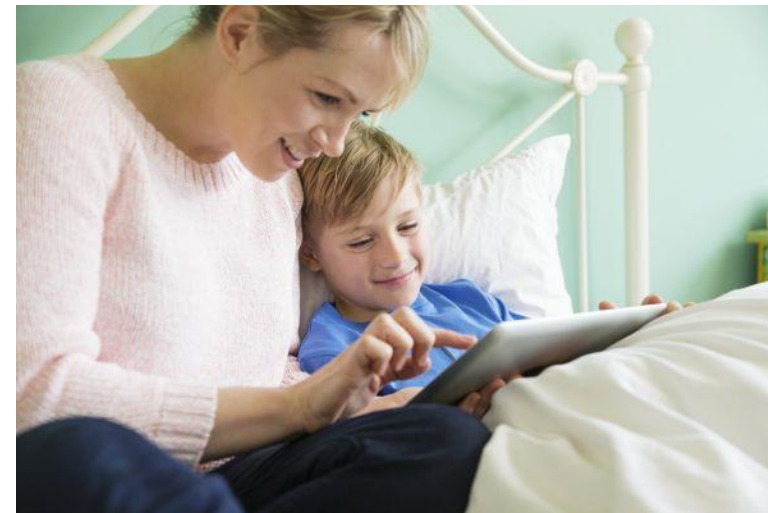
- GPs
- State Health
- Pathology
- Participant



10 million records
from 8 state and territory registers are now merged



Aims to eradicate cervical cancer
by 2035, the first country in the world to do so



Pharmacy

- Real-time prescription monitoring (SafeScript)
- Victorian Government Initiative



Provides access to a patient's prescription history for high risk medicines = enables safer clinical decisions.



**2.3 million
pharmacy alerts**



**414,000
prescriber alerts**

**SafeScript won the 2019
Victorian iAward for
Infrastructure & Platforms
Innovation of the Year.**

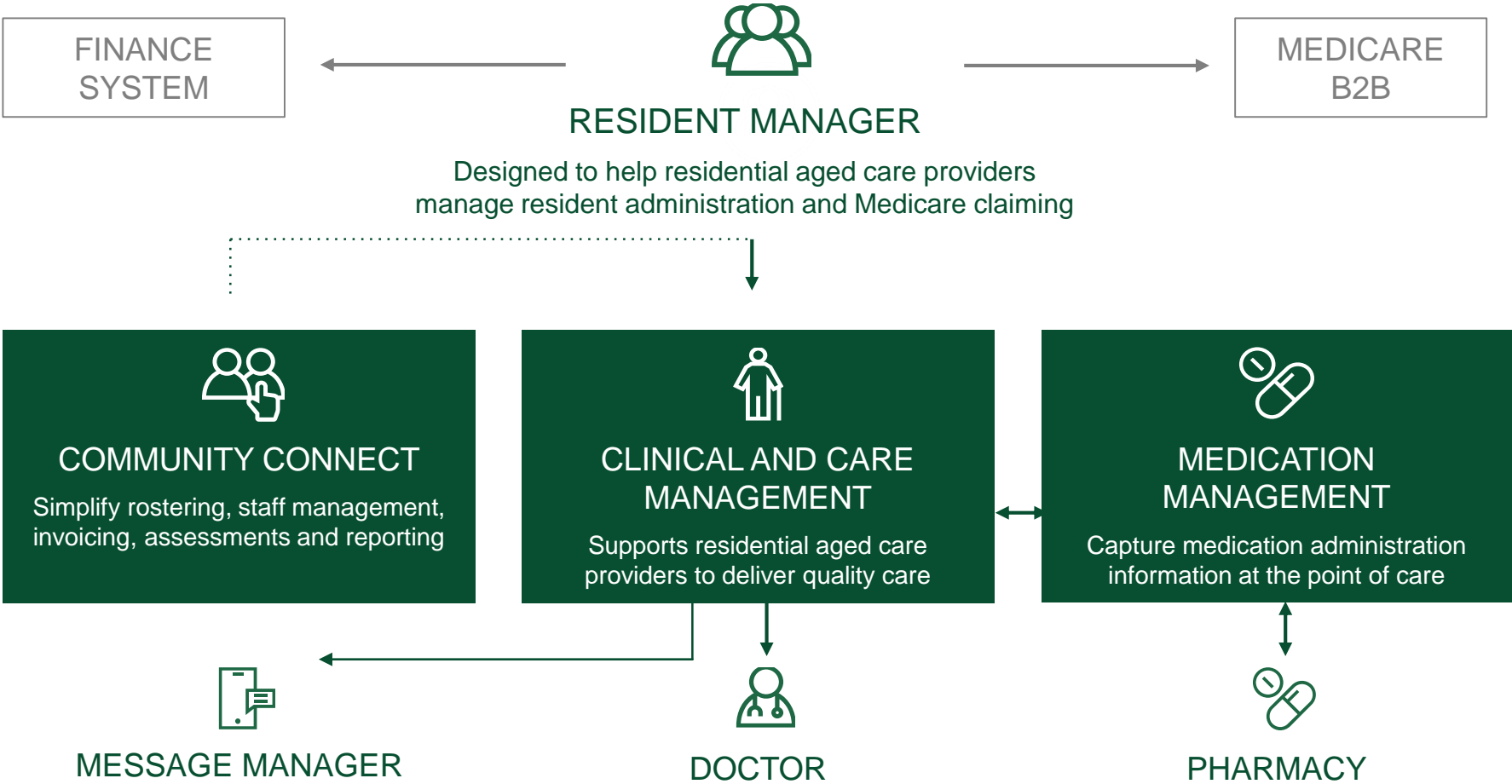


A woman with brown hair, wearing a black blazer over a black and white striped shirt, is sitting at a desk and smiling at the camera. She is positioned in front of a large white computer monitor. Her hands are on a white keyboard. She is wearing a gold necklace with a large green rectangular pendant and a gold watch on her left wrist.

Supporting the aged and disability sector



Aged and Disability Platform



Our Disability and Community Care software



Key focus

- Optimised Workforce and Client Management
- Compliance and Management Reporting

Key supported outcomes

- Intuitive scheduling
- Management of budgets and reporting
- Worker-specific mobile application
- Optimised routing and mapping



250+ providers are using our disability and community software solutions

Community Connect is the **next-generation** of disability and community care software in Australia

Our Residential Aged Care software



Key focus

Clinical care, medication administration, resident and communication management

Key supported outcomes

- Faster medication rounds and better governance
- Maximised funding and faster Medicare payments
- Better communication with residents' families
- Clinical outcomes based on person-centre care



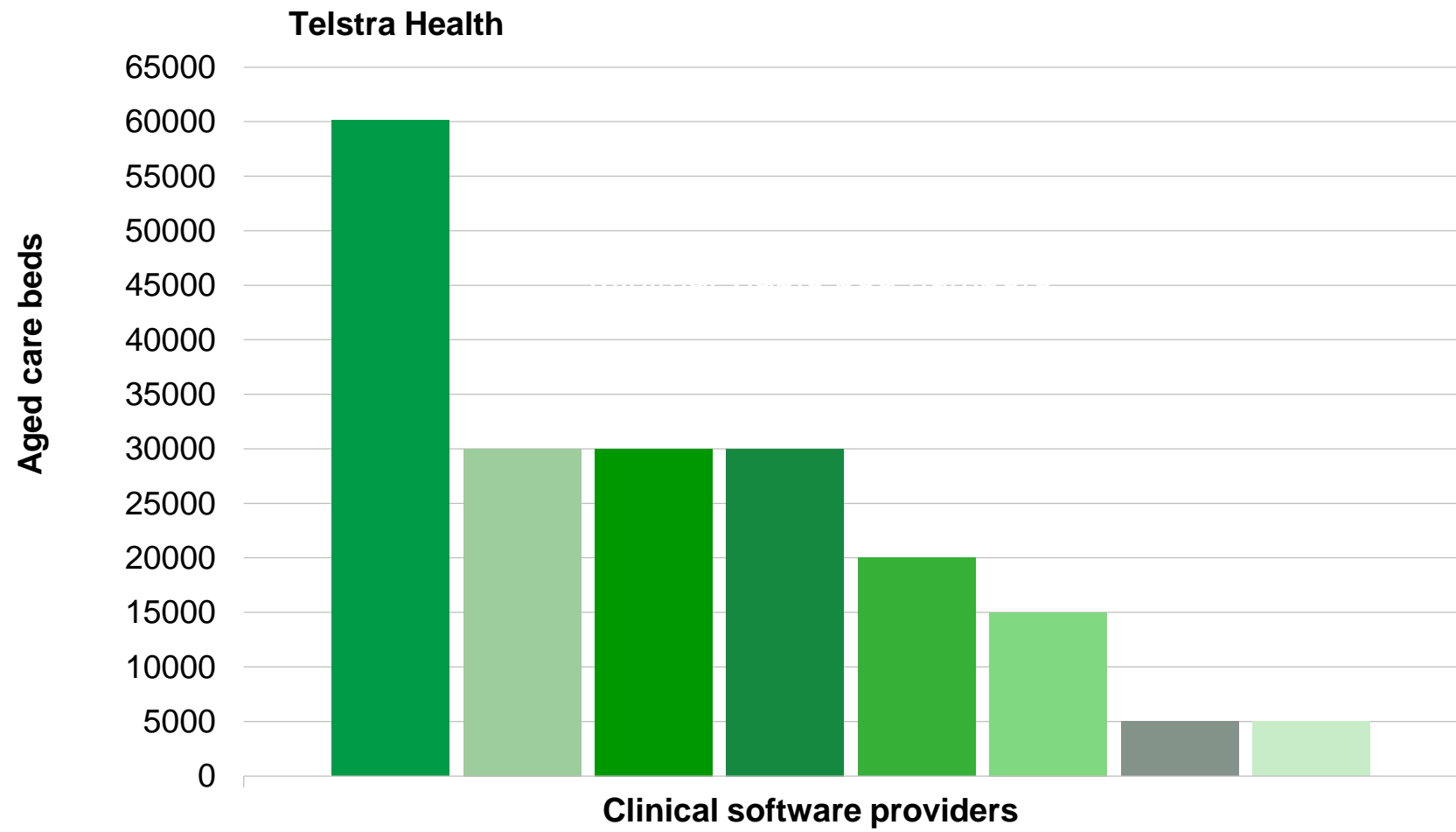
60,000+ aged
care beds

Multiple awards

*Business Service Markets Award –
Victorian iAwards 2019*

*Best Workforce Efficiency or
Quality Improvement Solution –
ITAC Awards 2016*

Australian residential aged care (~200k beds) clinical software market share





Predictive Analytics project



Current aged care data challenges



Unknown staff resourcing needs:

Difficult to plan accurate staff resource mix based on residents' changing acuity.

Unfulfilled end of life plans:

Challenging for staff to enact timely Advance Care Planning.

Unnecessary hospital admissions:

Residents deteriorating quickly requiring immediate hospital admission.

Underused data:

Key data in aged care relatively unstructured and is not easily extracted to predict clinical outcomes.

Predictive Analytics project



Telstra Health has partnered with **RMIT University** and the **Digital Health Cooperative Research Centre** to create new software to analyse the clinical data of aged care residents for signs of deteriorating health.

All data will be deidentified and the project will go through the RMIT Ethics Committee.

Provider data *not* Telstra Health data.



Sarah Evans (Telstra Health) with Michael Donnelly (Telstra Health), Professor Lawrence Cavedon (RMIT), Larissa Briedis (Telstra Health) and Professor Irene Hudson (RMIT).

Objectives of the project



Produce an algorithmic clinical tool for use in Telstra Health's Clinical and Care Management software to:

- Identify deteriorating residents so that clinical resources can be adjusted.
- Identify deteriorating residents to reduce avoidable emergency hospitalisation.
- Identify residents approaching end of life so that Advanced Care Plans can be enacted.
- Adapt existing algorithms and decisions support methods from other health sectors.
- Is residential aged care data predictive?



Who are the Digital Health Cooperative Research Centre? (DHCRC)



2018 Federal Government initiative - \$55 million funding.

“Mission to improve the quality of healthcare for all, through evidence”

DHCRC and Telstra Health are committed to research that has direct benefits for providers, and that is supported by commercial models.

Practical and industry led.



How will the RMIT partnership work?



RMIT University (Melbourne based) Postdoctoral Researchers and PHD students will spend time embedded within Telstra Health and with involved aged care providers.

Key focus:

- Data pattern and recognition and mining
- Consultation with aged care providers
- Algorithm creation and adaption
- Validation and evaluation



RMIT's Director of Research Partnerships & Initiatives Clare Russell with Digital Health CRC CEO Dr Victor Pantano.

A close-up photograph of two Black women smiling warmly at the camera. The woman on the left is wearing a blue and white striped tank top, and the woman on the right is wearing a blue top. They are both looking directly at the camera with bright, joyful expressions.

**How will the project
work?**



Project phases:



Phase one:
Discovery

Phase two:
Development

Phase three:
Apply & validate



Iterative process

Project phases



Phase one: **Discovery**

- Review Telstra Health's Clinical and Care Management platform to identify suitable data structures for analysis.
- Assess applicability of existing decision support in other care settings.
- Review key literature regarding data analysis to identify deterioration.
- Consult with clinical providers regarding signs/flags of deterioration and consider how this might be identified from recorded data in aged care settings.
- Obtain a de-identified data set from Telstra Health's clients and structure the data for analysis.

Phase two: Development

- Apply data analytic techniques for pattern recognition to the available data set, informed by review and consultation, including time series analysis, free text interrogation and data mining.
- Describe and codify algorithms for flagging deterioration in residents, then test the validity of these algorithms using historical data.
- Apply the algorithms to current data in a trial setting.
- Validate and evaluate performance of algorithms, with input from clinical experts.
- Agree specifications for enhancement of Telstra Health's software and assess proposed algorithmic solutions.

Project phases



Phase three: Apply & validate

- Integrate algorithms in Telstra Health's Clinical and Care Management software.
- Evaluate outcomes from use of algorithms in Telstra Health's Clinical and Care Management software.

A woman with dark hair, wearing a white blazer over a patterned top, is smiling and pointing her right hand towards a large digital display. The display shows various data visualizations, including a donut chart and a bar chart. The background is a futuristic control room with blue lighting and horizontal light bars.

Where are we now?

Current phase: Discovery



Current provider engagement:

- Identified one large and one small residential aged care provider for initial analysis.
- Working with initial clients for first process iteration and algorithm creation for clinical tool.

Future provider engagement:

- Canvassing all Telstra Health residential aged care clients to see if algorithm meets any immediate needs.
- Expanding project and reiterating process.

All data will be deidentified and the project will go through the RMIT Ethics Committee.

Current phase: Discovery

What type of data may be predictive?

- Predictive nature of data is currently unknown.
- Possible predictive data around health deterioration, including:
 - Food and nutrition
 - Bowels
 - Falls
 - Polypharmacy
 - Sleep patterns



Benefits of Predictive Analytics project



- Enhance staff decision making abilities through predictive data.
- Reduce unnecessary and unplanned emergency hospital admissions.
- Achieve continuity of high-quality, specialised care where needed.
- Enact Advanced Care Plans in a timely manner and enable residents to remain in an environment they are familiar with and supported in for end of life.



Potential future applications

Community care and disability sector

The tool could potentially help community aged care and disability providers to:

- Determine staffing needs.
- Alert upcoming potential care plan changes.
- Alert possible need to transition to residential aged care or respite.



Thank you