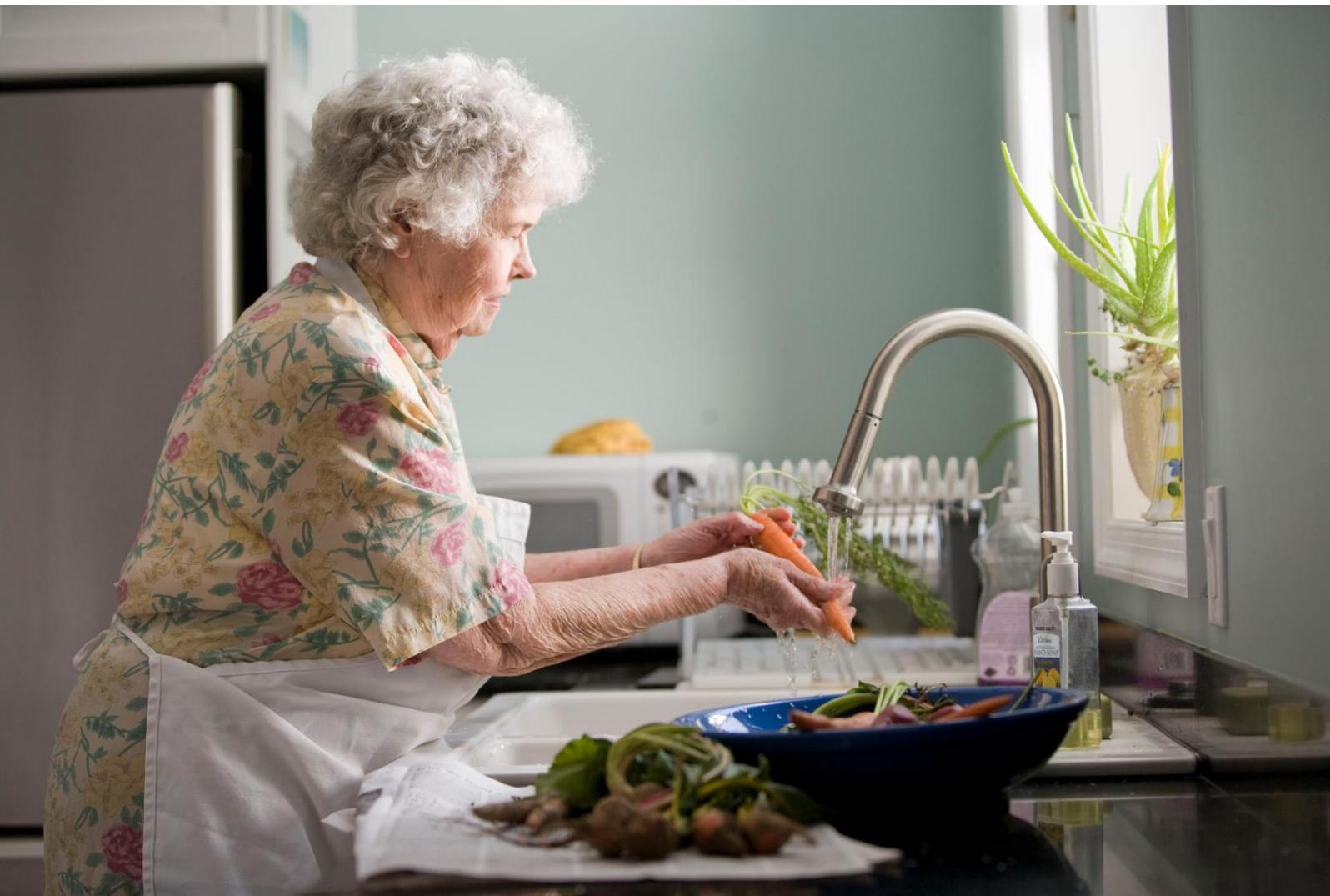# Smarter Safer Homes: Technology to support older adults living independently

A summary of the independent living impacts of the Smarter Safer Homes Platform

Consumer driven technology to meet the needs of older adults

By 2050, the global population is expected to reach 1.5 billion, double the current figure.

Additionally, life expectancy on average is expected to increase by an additional 19 years, due to improved nutrition and healthcare.

In Australia, over 20 years (1999-2019), the proportion of people aged 65 and over increased from 12.3% to 15.9%.

These demographic changes, as well as the desire of people to age at home, call for innovation in healthcare provision.

The SSH platform allows older people to maintain independence at home or in aged care facilities

"The thing works, as I saw, it's just picking up movement or heat or whatever, it's not watching what you do, and it doesn't know what you're doing."

Leveraging technological know-how

Harnessing the rapid development of wireless sensor technology, CSIRO developed a platform to help solve the problem of providing health care to an increasingly large number of older people who desire independence.

The platform, called Smarter Safer Homes (SSH), was developed in consultation with aged care service providers. Since 2019, CSIRO has been trialling SSH technology.

How does SSH work?

The SSH platform is made up of environmental sensors and sensor networks that can monitor the physical environment within the home, as well as human activity.

SSH collects data from the sensors that provide daily updates about how a participant is functioning.

The platform includes a sensor-based in-home monitoring system (data collection), a cloud computing server (data analyses), and a client module (data presentation) with a tablet app, a family portal, and a service provider portal.

Service providers, family members and other caregivers can check a data dashboard showing unusual patterns in patient behaviour. If, for example, mobility has been irregular, this might suggest something is wrong and a visit can be made to the participant's house.

What the sensors measure

- movement
- humidity
- light power
- vibration
- sleep

Features

Resident Mobile App

Using the tablet based SSH app, residents can access the progress and summarised information derived from the SSH platform.

Co-designed with participants, the app interface displays the progress status of daily activities of living as well as physical and social activity.

Figure 1: SSH tablet application allows participants to view data derived from sensors.

An example of the app's dashboard reflecting the daily status of health and wellbeing is represented by the different coloured rays (Figure 3). A three-quarter extension of the ray indicates individuals achieving their expected goal of health or wellbeing measures, whereas a

ray below is a decline and full ray is an increase in their state of wellbeing

> "Facilitates targeted conversations with clients."

Family Portal

It can be an anxious time for family and close friends when they know an older adult they care about is living at home alone.

The SSH platform includes a portal that gives peace of mind by providing insight into the activities of daily living of the participant via an app.

> "I loved it. It was a good feeling when someone called and asked if everything is OK. It made me feel better."

Figure 2: Family portal available through internet browser allows approved family members to view participant data.

Participants can make data available to family members or nominated contacts across four levels of access. The family portal information is presented in the same format as the resident app.

Service Provider Portal

The service provider portal provides access for professionals to monitor a participant's profile and show service providers if the participant's routine differs from usual (defined by data collected during a baseline period).

Those with access to the system can "check-in" regularly to see how the participant is managing with day-to-day tasks.

The portal also has the capacity to present an individual's activities of daily living over various time periods (for example, weekly or monthly).

Figure 3: Service provider portal includes a list of smart home participants.

Clinical Trial

In partnership with three ACSPs we conducted a trial to test the effectiveness of the SSH platform. We installed SSH sensors in the homes of people living independently in the community. With their consent, we gathered and analysed data based on a measure called "activities of daily living". This is a measure of individualised functional independence and can be used to determine some aspects of how well a person is doing at home. We also interviewed residents and their carers about the experience of living with the sensors.

> Trial Partners:
>
> **Anglicare Southern Queensland**
>
> **integratedLiving Australia**
>
> **All About Living**

Peace of mind for families, caregivers and older people

Our trials found evidence that older people living with SSH showed 10 times less decrease in social care related quality of life than the control group who experienced usual care. This monumental finding validates the SSH platform as beneficial in ensuring older people can live independently their home for longer.

> "I knew if something happened to me, you guys would be there as a – to say, well are you okay?"

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For further information
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