

Ageing and Integrated Care in the Netherlands and Singapore: shared challenges, different journeys – a conference report

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The key enabling factor to self-management is to put patients at the driver seat, by giving them unlimited, real-time access to all personal medical data and channels to communicate with healthcare providers.

This paper reports on a seminar and networking event on Ageing and Integrated Care in Singapore, which was hosted by the Embassy of the Kingdom of Netherlands on the 29th of April 2016. Seven speakers from the Netherlands and three from Singapore delivered short presentations on four topic areas about ageing and integrated care: country innovation strategies; health system innovation; research and development; learning and education. The sharing of experience had inspired mutual learning; and fostered cross-country collaboration in the very near future.

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Ageing and integrated care are inextricably linked.

Rapid population ageing demands, as well as drives, radical changes to health systems traditionally designed to respond only to crisis [1]. Integrated care has become even more urgent, and relevant, in the face of challenges posed by ageing [2]. A seminar and networking event on Ageing and Integrated Care was hosted by the Embassy of the Kingdom of Netherlands in Singapore, on the 29th of April 2016 (see event here). It attracted about 110 delegates across different sectors (industry, government, academia) from both countries. This paper summarizes the content

from nine presentations and compares country journeys in four key areas: country innovation strategies; health system innovation; research and development; learning and education.

Country innovation strategies

The Netherlands and Singapore pride themselves with health systems that are highly ranked globally [3, 4]. Both countries face the challenge of a greying population and increased chronic disease burden. The government of the Netherlands, as represented by Ms Odilia Knap from the [Ministry of Economic Affairs \(Netherlands\)](#), responded to this challenge by appointing Life Sciences and Health (LSH) as one (out of nine) priority sectors, where there was preferential support for research and innovation [5]. A strong LSH knowledgebase was created through 1200 biotech companies, 8 university medical centres and 12 universities – all within a 120 mile radius in the country. Public-private partnerships are key catalyst to bringing the Netherlands to world's leading position in LSH business and innovation. One such notable partnership was formed between the Dutch Kidney Foundation and a Singapore LSH company AWAK Technologies. Their invention of the portable artificial kidney is expected to benefit 2.5 million kidney patients worldwide [6].

Whilst a greying population is commonly seen as a crisis to an already stretched health system in Singapore, A/Prof Chin Jing Jih from Tan Tock Seng Hospital (Singapore) stressed on the importance of changing such conventional perception (of 'crisis') to a new way of perceiving 'opportunity' in ageing populations. A/Prof Chin gave examples of new opportunities presented in sectors such as education, business, health and social care. In education, new opportunities are created for training of healthcare providers (including many who seek mid-career switch) in geriatric care and education of elders in self-care. As the next cohorts of the elders would be more educated and more likely to seek knowledge, there will be even more opportunities for engagement through education.

Some perceivably "young-person" products (e.g., computer games), if modified, might interest the elders – hence opening up new market segments for old business products [7]. Also, traditional perceptions on intergenerational competition for space and resources can be altered by innovations, for instance co-location of schools and care homes; or shared public spaces through dual-function facilities. In Singapore, cultural values of respect for the elderly and filial piety can be perceived as a significant social capital for strengthening intergenerational solidarity. More is however needed to be done in improving the physical environment of the elders. This involves new opportunities to use research and innovation in producing technology that is both high-tech and high-touch [8].

Health system innovations

Four speakers spoke about new models of care, which would bring radical transformation to the traditional hospital-centric practices. First, Prof Sophia de Rooij from University Medical Centre Groningen (Netherlands) presented an antithesis to hospitalisation: '[Hospital at Home](#)'. As the name suggested, hospital at home replaces conventional treatment in the hospital wards with treatment at home by hospital-at-home teams. This idea was conceived out of the concerns that elders often face problems of malnutrition, delirium and fall during hospitalisation. This project involved the designing of new care trajectories: i.e., by changing the old trajectory of sending the elders from the Emergency Departments to hospital wards to a new trajectory of sending them back to their homes.

The re-design of this trajectory was co-created with the seniors and the municipal. If hospitalisation is indeed required for the acutely ill elders, a project called 'Seniorlines' was created to activate value based medicine, where priorities and decisions on treatment are shared with the patients; hence changing the question from "what is the matter with you?" to "what matters to you?". In cases of hospitalisation for at-risk elders, another project called translational care (now implemented in 29 Dutch hospitals) bridges hospital with home care with post-discharge visits by the community care nurses.

Translation care was shown to reduce 100-day post-admission mortality by a significant 25% [9]. Meanwhile, elders in the Netherlands are encouraged to age in place as long as possible; as the number of institutional care (e.g., nursing homes) in the country was decreasing [10]. At present, about 85% of people aged 85 and above in the Netherlands live alone without any help; when needed, help was available in the community from the General Practitioners.

Next, Mr Evert Jan Hoijtink (CEO of Portavita) and Prof Mark Kramer from VU University Medical Center Amsterdam (Netherlands) shared their 15-year journey creating '[Portavita](#)', an Amsterdam-based integrated care management system. Their first project involved an internet anticoagulant clinic, which used internet to connect patients to multi-disciplinary teams in order to support self-management for medications as complex as anticoagulants. Today, Portavita served about 526,000 patients of various chronic conditions with support of 10,000 medical professionals. Of these, 100,000 patients were able to self-manage.

The key enabling factor to self-management is to put patients at the driver seat, by giving them unlimited, real-time access to all personal medical data and channels to communicate with healthcare providers. Instead of working with the traditional discipline-based approach, Portavita created Regional Care Groups which consist of multi-disciplinary providers from different levels of care. Care Group Managers receive contracts and payment from health insurance companies, replacing the traditional discipline-based payment modality. GPs act as the primary care providers in the care groups; with their service contracts tied to their performance. Under a value-based payment modality, under-performing GPs would cease to receive further contracts. The Portavita model reported a huge reduction in the percentage of patients needing outpatient hospital care. In 2016, less than 10% diabetes patients sought care from the endocrinologist (vs. 19% in 2013) and 0% sought care from the ophthalmologists (vs. 100% in 2008).

The fourth speaker was Mr Arnold Bos from 'ZorgDomein' (Netherlands). Fifteen years ago, the interface between primary and specialist care was a 'no-man's land' when the lack of information exchange resulted in efficiency loss and unsatisfactory patient experience. [ZorgDomein](#) ventured into such no-man's land and created an information sharing platform between the GPs and the specialists – a game changer which had its function expanded to other components of care later on.

By thinking strategically about closing the demand-and-supply gap, ZorgDomein focuses on areas with large volume (i.e., outside of highly specialised care) where standardisation could significantly improve efficiency and reduce cost. Used by the majority of the nation today, transformation brought by ZorgDomein enables choice, transparency and cost-effectiveness. One important example is the replacement of the traditional single-queue appointment system with a collaborative model, where multiple queues are established for appointments based on medical indications, urgency and pre-planned arrangements.

Research and development (R&D)

New technologies and knowledge about ageing are generated by various research initiatives in both countries. Mr. Gerard Lenstra from Investment & Development Agency for the Northern Netherlands (NOM) shared the Netherlands' R&D experience through two initiatives: 'Lifelines' and 'SPRINT'. [Lifelines](#) is an observational population based cohort study that tracked her participants' lives at different time points across a time span of at least thirty years. The study aims to investigate why some people age in a healthy manner, whilst others have severe impairments or diseases early in their lives. So far, data have been collected from over 165,000 participants across three generations (grandparents, parents and children).

This ambitious and hugely laborious study is expected to provide data for epigenetic, biomedical, environmental and psychosocial factors in relation to healthy ageing, disease development, and general wellbeing. Meanwhile, [SPRINT](#) or the abbreviation for "Smart Prevention, Rehabilitation & INtervention Technologies for improved mobility" was a Centre of Research Excellence founded in 2011. Its mission is to improve mobility especially for the elderly, but also for the disabled. Amongst their many innovations, the presentation showcased leg prosthesis (to improve lateral balance), wearable multi-parameter monitoring (e.g., smart contact lens to monitor blood sugar), assisting devices for improved mobility, serious games for balance training and modified office structure for improved posture.

In Singapore, traditional centre-based post-stroke rehabilitation services face a longstanding problem of low patient attendance. A new service of tele-rehabilitation, as presented by Dr Arthur Tay from National University of Singapore, was expected to improve rehab adherence by allowing patients to consult their therapists from home. This is made possible by the invention of wearable wireless sensors which accurately measure arm strength and tracked rehab exercise. Data from the sensors would be used by therapists to evaluate progress and prescribe rehab exercise.

This evaluation does not need to be real-time, hence resolving the issue of therapist shortage. Patients and therapists maintain communication through weekly video conferencing [11]. However, this service is twice as expensive as traditional centre-based service. To justify the allocation of government subsidy for this new service, a randomised control trial (with cost-effectiveness evaluation component) is currently underway.

Learning and education

Both countries are looking for innovative ways to learn about ageing. Mr Paul Gagnon spoke about using technology to improve learning at Lee Kong Chian (LKC), School of Medicine, Nanyang Technological University (Singapore). All students at LKC are issued an iPad: a basis for forming an e-learning ecosystem of the 'iLKC'. Using a metaphor of the double helix DNA, the previously separated strands of curriculum and technology are now blended seamlessly. This encourages team-based learning and easier tracking of students' performances and progress.

Challenges for this endeavor currently include the lack of internet connection at partner premises outside of iLKC, managing stakeholder expectations, enhancing online interactivity, staying ahead of the digital curve and integrating artificial intelligence with learning.

Last but not least, Ms Lotte Vergouwen from Ijsfontein (Netherlands) introduced playful learning to educate game players about ageing. '[Ijsfontein](#)' is a gaming company based in Amsterdam, and more recently in Dusseldorf and Bangalore. Its philosophy is to use games to induce individuals' intrinsic motivation in acquiring, through curiosity, new skills, attitudes and behaviours. Games are tested against three core values: motivations, usability and effectiveness.

Examples of Ijsfontein's products included 'ABCDE sim' (i.e., simulation based game to train learners on ABCDE protocol), 'Into d'Mentia' (i.e., simulation of dementia experience through visual and audio effects), 'Delirium Experience' (i.e., simulation game for understanding delirium) and 'Little Red Riding Hood' (i.e., a game of keeping the granny in her own home as long as possible; to understand about ageing-in-place). The latter of the two games were created in collaboration with Prof Sophia de Rooij.

Conclusion

The Netherlands' government policy on public-private partnership is consistently reflected in all case examples presented: from Portovita, ZorgDomein, SPRINT to Ijsfontein. In comparison, private sector participation in Singapore while few at present are expected to rise [12]. Initiatives in Singapore are possibly in their infancy and hence more likely to be program-bound (e.g., tele-rehab) or geographic specific (e.g., iLKC).

Although it was evident that the Netherlands has ventured ahead in the Integrated Care journey well ahead of Singapore, both countries emphasized on the importance of mutual learning and remain committed to collaborative undertakings. Beyond the presentations, the event was extended by lunch with further exchanges of ideas – and visiting cards.

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The seminar and networking event on Ageing and Integrated Care was hosted by the Embassy of the Kingdom of Netherlands in Singapore, on the 29th of April 2016 ([see event here](#)).