War on Diabetes – How HealthTech can Help Win the Battle

Background

Diabetes is one of the most burdensome diseases to affect mankind, given its prevalence and potentially devastating morbidity if not managed well.

The world is currently suffering a diabetes epidemic and Singapore/Asia are no exception. As much as 6% of Singapore’s healthcare spending (more than $1 billion a year) has been devoted to diabetes and its complications. To address this growing problem, Health Minister Gan Kim Yong declared War on Diabetes by announcing a new Diabetes Prevention and Care Taskforce on April 13, 2016.

The prevalence of diabetes in Singapore has risen to 12.3% in 2013, from 8.2% in 2004 and 9% in 1998, surpassing other Asian countries (2013) such as Hong Kong (9.5%), Japan (7.2%) and Taiwan (9.8%), according to International Diabetes Federation 1.

In declaring War on Diabetes Mr Gan said: "The war on diabetes will not be a quick battle, but a long war requiring sustained effort". The Ministry has proposed three key areas in the multi-year plan:

- Reduce incidence of new cases of diabetes via prevention and healthy lifestyle promotion programs
- Strengthen early screening and intervention to identify the disease early among those at risk or undiagnosed
- Improve disease control and reduce complications

Galen Growth Asia (www.galengrowth.asia), Padang & Co (www.padang.sg) and Access Health International (www.accessh.org) have come together to examine ways in which HealthTech can assist the War on Diabetes.

This paper summarises our findings to date and outlines Next Steps, which we believe will present solutions to have tangible impact in accelerating the adoption of HealthTech in diabetes – and thereby assist the fight.

Diabetes in Singapore

We take a pan-Asian perspective in this study from our base in Singapore. We expect our findings and recommendations to be applicable not just in Singapore but also across East Asia.

According to International Diabetes Federation estimates there are 542,000 adults with diabetes in Singapore, of whom 254,000 are undiagnosed. There are also significant numbers of pre-diabetics with impaired glucose tolerance and risk factors for diabetes development (obesity, poor diet, lack of exercise etc).

Of diagnosed diabetics, approximately 70% are early stage (less than 10 years post diagnosis), 25% late stage and 5% complex stage (with long term complications of diabetes e.g. arterial disease, renal failure).

The focus of our work is on pre and early stage type 2 diabetes since these are patient segments where HealthTech has potentially the greatest impact to prevent onset of clinical diabetes and (once diagnosed) to slow progression of the disease and significantly reduce risk of progression to the catastrophic complex stage. These are also the 2 largest patient segments with the greatest potential for cost savings to the healthcare system through prevention and better management.

Rationale for HealthTech interventions

HealthTech approaches have proven to be successful in modifying patient behaviour and preventing or slowing disease progression in diabetes. Several start-up companies have been established around the world to provide better monitoring and management of the disease. Companies in the US such as www.glooko.com, www.omadahealth.com and www.livongo.com are all pioneering new approaches and have been backed by savvy investors.

We are just beginning to see Asian HealthTech companies tackling the problem (e.g. www.holmusk.com, www.health2sync.com, www.connhealth.com) and we believe the sector will develop with appropriate support from the ecosystem. We will also see HealthTech companies more broadly positioned in the ‘wellness’ space starting to influence diabetes (e.g. www.cxagroup.com, www.globetrekkerchallenge.com).

Payers and governments around the world are also beginning to recognise the potential for HealthTech to significantly enhance diabetes management, with resultant long term cost savings to healthcare systems and better patient outcomes.

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HealthTech solutions in diabetes are effective primarily since they provide:

- Better management of the disease through closer monitoring of blood sugar levels as well as real-time measurements of diet, exercise and other lifestyle determinants of disease outcome.
- Feedback to patients and alerts to caregivers allowing earlier intervention in cases of poor management and higher levels of patient engagement, particularly if solutions incorporate social media/gaming principles which can be very effective in driving behaviour change (one of the key determinants of disease outcome for diabetes).

Singapore/Asia has so far seen limited adoption of such approaches, for a number of reasons, which are described in this paper. It is time for a concerted industry and government effort to accelerate the adoption of HealthTech approaches to diabetes management in light of Singapore’s War on Diabetes and the global epidemic.

**Approach**

Addressing challenges to the implementation of HealthTech solutions in diabetes will require participation of a wide range of players: medical device and pharma companies, healthcare organisations, insurance companies, government agencies, start-ups and many others.

Recognising this we have taken the approach of seeking input from a sample of such players through 2 workshop sessions, which we organised in August and November 2016. These structured discussion involved more than 50 participants from 15 organisations (including medical device companies, pharma, insurance companies, start-ups and Singapore government organisations). We encouraged participants to share their views, discuss and debate issues around the barriers to HealthTech adoption for diabetes in Singapore/Asia and to develop broad recommendations for further study.

This report summarises these discussions and lays out some key issues which the industry needs to address. Phase 2 of our work, which will last for 6 months starting May 2017, involves developing solutions and approaches to address these barriers. These will be developed in collaboration with 3 start-up companies in the Diabetes HealthTech space and a panel of industry collaborators.

The output of Phase 2 will be further public White Paper, which will share our learnings publicly, and the tangible progress which the 3 start-ups and our industry collaborators will have made from involvement in this process.
Findings and recommendations to date

Findings from our discussions and workshops have highlighted 3 broad areas where more work is needed to identify and implement approaches to support maximal adoption and effectiveness of HealthTech approaches in diabetes:

1. Defining successful approaches to drive behavioural change in an Asian cultural context
2. Encouraging innovation in payment approaches incorporating HealthTech intervention based on increased patient self-responsibility for their own health
3. Addressing fragmentation in the healthcare delivery system to support effective rollout of HealthTech approaches in diabetes management

1. Defining successful approaches to drive behavioural change in an Asian cultural context

Singapore and Asia represent a specific environment with their own characteristics. For example:

- Singapore has **multiple segments of patients**, which might be defined along different axes – age, race, socio-economic level, attitudinal bias etc.
- **Patterns of behavioural influence are also very culturally specific** and include family members, peers, domestic helpers, VWOs/patient organisations and others
- **Lifestyles and diet are again specific** (and vary by patient segment) – for example Hawker Centres may be an important point for dietary intervention

In order for interventions to be effective in such a complex environment they will need to recognise the different patient segments and to develop segment-specific approaches to drive behavioural change. A ‘one-size-fits-all’ approach to behavioural intervention will not work.

An approach, which we believe will be effective, entails:

a. Defining a practical approach to **patient segmentation** and using tailored approaches to address the different segments. Segmentation may be age or socio-economic class based, but must also address racial differences, which may underpin genetic as well as cultural differences in responsiveness to interventions.

b. Developing **targeted communication approaches** to the different population segments – e.g. thinking through the effectiveness of higher profile ‘scare’ approaches to communicate the long term costs of poor self-maintenance (while the effectiveness of such approaches is questionable this depends on the cultural context and deserves study)
c. Supplementing the above with testing and prototyping innovative social media driven approaches using peer and family pressure (based on both encouragement and fear) to drive behavioural change. This ‘gaming’ approach potentially amplifies the impact of family and friends on individuals and may be particularly relevant in Asia, where such networks are arguably more powerful than in the west.

2. Encouraging innovation in payment approaches incorporating HealthTech intervention based on increased patient self-responsibility for their own health

The current approach of health insurance in Asia does not support financial incentives needed to pay for HealthTech interventions since it is largely based on a fee-for-service, episodic, reimbursement model. Innovative approaches are needed which can be developed by insurance companies as they rethink their own business models, e.g. lower-cost insurance for patients if they adhere to wellness regimes – including HealthTech-enabled tighter self-management of their diabetes.

In the US HealthTech interventions are increasingly being reimbursed by insurance companies (and the government) as data becomes available to demonstrate long-term cost savings through reduced morbidity as a result of these interventions. Reimbursement is a key driver of HealthTech adoption.

Constraints in Singapore/Asia which have so far hindered similar approaches include:

- **Generally less sophisticated health insurance approaches**, which do not significantly influence clinical practice in order to reduce cost and improve outcomes. This is slowly changing as managed care approaches develop, primary care expands and some large healthcare providers shift their stance towards a more collaborative approach towards insurers

- **Limited innovation to date** by health (and life) insurers using HealthTech tools and related patient incentives to change behaviour. Much as motor insurers incentivise safe driving (through subsidizing preventive driving courses and implementing telemetrics to monitor driving behaviour), health insurers and governments need to innovate around incentives for better self-management of chronic disease

- **High level of self-insurance** by corporates – who have even less capability (and scale) to influence clinical practice and therefore their own healthcare cost base
• **Switching between health insurance providers:** Health insurance is often paid for by employers (or covered through self-insurance), meaning that each time an employee changes job his insurer changes. As a result insurers are currently poorly motivated to invest in early stage disease prevention or slowing of disease development (e.g. for diabetes) since the benefits of such interventions may accrue to other insurers.

• **Innovation in product design** (e.g. providing insurance for diagnosed diabetics – generally currently considered uninsurable) is hindered by **inability of insurance companies to price** such products due to limited data to date. Similarly for HealthTech interventions e.g. in diabetes data is still limited on long term outcomes benefits.

A major driver of adoption of HealthTech approaches for Diabetes in Asia will be funding by payors and governments to support viable business models for HealthTech companies in this area.

It will be critical for governments and payors to develop long-term, system-based views of the health economics of HealthTech interventions as a basis for funding decisions. Payors in the US are moving rapidly down this route but experience in Asia is so far limited, and will need to be built up through pilots and fostering a deeper understanding of HealthTech among payors in Asia, coupled with product innovation in insurance.

3. **Addressing fragmentation in the healthcare delivery system to support effective rollout of HealthTech approaches in diabetes management**

Achieving effective rollout of innovative HealthTech approaches in early stage diabetes will require coordination across different parts of the healthcare systems and possibly the introduction of new approaches to care and disease management. HealthTech approaches are well placed to provide such coordination, although innovative business models will need to be developed to align interests across healthcare providers.

The following areas have been identified as critical to supporting accelerated adoption:

• **Improving detection rates for pre-diabetes and undiagnosed type 2 diabetes** then using HealthTech approaches to drive behavioural change. This will require HealthTech players to work with public health organisations (e.g. Singapore’s Health Promotion Board) and insurers (e.g. through health screening of corporate clients) and is a critical component of improving healthcare delivery given the very high levels of undiagnosed pre- and early stage type 2 diabetes.
• Implementing medically-recognised care pathways for diagnosed and pre-diabetics to generate behavioural change, appropriate medical/pharmaceutical intervention and also to ensure optimal levels of monitoring and self-testing for key measures of disease progression (e.g. blood glucose, HbA1c, blood lipid profile, blood pressure, screening for diabetic eye disease and neuropathy etc). Such pathways are poorly delivered in most of Asia’s current healthcare systems, resulting in poor diabetic control. (Nephrologists at Singapore’s National University Hospital believe that 60% of Singapore’s diabetes fail to meet blood sugar targets, resulting in a still rising incidence of kidney failure – a severe end stage complication of diabetes). This is a challenge for Singapore’s healthcare system particularly, where independent private practitioners deliver 80% of primary care and currently have fragmented approaches to implementing the best practice. However, for better and more cost-effective care for diabetes (as well as other chronic diseases), coordination challenges must be addressed and HealthTech can play an important coordinating role to bridge the gaps.

• Supplementing existing healthcare resources with new approaches to enhance/assist diabetes management. Based on approaches developed in the US and Europe, 2 further components of diabetes care delivery could be developed/enhanced to assist diabetes management, both of which could be enabled/supported by HealthTech approaches:

  – Non-physician 'health coaches' who can interact with diabetic patients by phone, video conference and through HealthTech apps to reinforce behavioural change

  – Patient support/advocacy groups can play a useful role in building awareness and understanding of the disease. Such groups can also play a role in stimulating patient engagement through HealthTech channels involving Social Media and need to be brought into the ecosystem.

HealthTech can address many of these issues by providing connectivity and coordination across the healthcare delivery system. HealthTech startups and collaborators will need to work closely with healthcare providers to develop effective approaches to address these challenges. Again, business model innovation and structuring partnerships across the ecosystem will be key to driving future change.
Next Steps

Having laid out the challenges above, Galen Growth Asia, Padang & Co and Access Health International plan to coordinate various parties to catalyse the industry towards achieving tangible solutions.

We are in the process of setting up a working group of industry collaborators (including re/insurance companies, medical device companies, healthcare delivery organisations and 3 HealthTech startups) to share knowledge and best practices around various pilots for adoption of HealthTech in Singapore and other Asian markets. This will result in tangible solutions to be implemented by our Startup partners and industry collaborators.

We will share learnings and more detailed issues to be resolved as we go along, and engage others (e.g. regulators, governments, payors) in our discussion as our conclusions develop. We believe that a guided, industry-led approach is the way forward and hope to shape the future of HealthTech in Diabetes in Asia through this work.

Finally, the Singapore Health Promotion Board is holding a Designathon in July 2017 organised by alliance member Padang & Co. The Designathon will involve a wide range of the public and professionals to co-create solutions to encourage healthy living behaviours. We will inject our thinking and resources into this Designathon through Padang & Co and hope this will provide guidance and focus to the innovators who will engage in this challenge.

Please address questions and requests for collaboration to:

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