Waste not, want not

Information and its role in reducing medication waste
“Waste not, want not” is a phrase first recorded in the late 18th Century and means if one is not wasteful then one will not be needy – applying this to healthcare is complex.

There are many areas of waste in any system but due to the size of healthcare, the number of employees and its significant cost as a proportion of a nation’s GDP, any inefficiencies can have an enormous impact.

In healthcare, these can lead to different types of waste, including time, resources and medications.

The purpose of this paper is to look mainly at the issue of medications waste, an area where the use of better information could significantly reduce the problem.

There is a lot of research and discussion on how to manage medication waste from an environmental point of view because of the impact of incorrect disposal and the effects of Active Pharmaceutical Ingredients (APIs) as trace contaminants.

In New Zealand, medicine disposal has been labelled a National Disaster, with official services patchy and no studies on the long-term effects on the environment (RNZ, 2015).

However, the discussion put forward below focuses on how prescribed medication waste can be reduced in the first place, so as to limit the need for disposal. This is an upstream approach to the issue rather than the downstream management of the impacts of excess and unused medication.

It will argue that better information can lead to more efficiency, but this will require a far wider appreciation of its benefits and more use of information technology.

It will look at the need for people to become more engaged in their healthcare and to have greater understanding about medication, its value and efficacy.

It will cover changing perceptions about privacy and potential changes to the medication supply chain and delivery.

The discussion is covered in the following sections:
HOW DOES MEDICATION WASTE OCCUR?

We are all guilty – we all have medicine cabinets or drawers at home with unused out of date medication - it is a global problem.

So why does this occur?

For most of us, it’s probably a case that we just didn’t finish the course of medication, or we forgot to take it, didn’t remember we had it or kept it just in case – the last of these is known as a prophylactic approach (Ruhoy & Daughton, 2008).

Over-prescribing also happens, for instance when a patient leaves hospital with a larger supply of pain medication than is actually needed.

While for many it’s just a minor problem of a few pills sitting in a drawer, there is a far larger issue of medication waste and its disposal, on a national and international scale.

There are many reasons for it, including inefficiencies and certain practices of manufacturers, distributors, prescribers, dispensers and patients themselves (Ruhoy & Daughton, 2008).

Specific ones include stat-prescribing or all at once bulk dispensing. This was introduced in New Zealand in 2003 and was predicted to increase overall dispensed medications by 6 per cent (Tong et al, 2011) or $48m based on a total medication spend of $800m.

Stat prescribing is convenient for both the clinician and patient, even if not all the medication is used. One batch dispensing means less need for another pharmacist visit, but the process is also indicative of a low value perception of pharmaceuticals.

Figure 1.0: UK cost of unused medication and what it could pay for?

The UK’s Department of Health estimates that unused medicines cost the NHS around £300m annually, (NZ$630m), with an estimated £110m (NZ$230m) worth of medicine returned to pharmacies, £90m (NZ$190m) worth of unused prescriptions stored in homes and £50m (NZ$105m) of medicines disposed of by Care Homes.

This would pay for:

- 11,778 community nurses, or
- 80,906 hip replacements, or
- 19,799 drug treatment courses for breast cancer, or
- 300,000 drug treatment courses for Alzheimer’s, or
- 312,175 cataract operations

These startling figures don’t even take into account the cost to patients’ health if medicines are not being correctly taken.

Source: www.medicinewaste.com
This practice has also been normal for rest-homes where bulk supplies have been provided to cover needs with little reconciliation for used and unused medication.

While rules for monthly supply came into effect a few years ago for the aged care sector, there is still waste resulting from medicine changes, such as to packaging, and how these are managed.

**the most prominent reason for waste is non-adherence**

Probably the most prominent reason for waste is non-adherence, identified by CapGemini (2012) as one of the most serious problems in healthcare, posing a heavy financial impact on all constituencies.

Leftover unwanted pharmaceuticals tend to accumulate after being set aside, stored or forgotten – and this occurs at just about any location where people live, work or visit. Locations are associated with the demands and expectations for the easy accessibility and availability of medications (Ruhoy & Daughton, 2008).

**we have become used to having medications available when and where we need them**

Put simply we have become used to having medications available when and where we need them. Availability has become part of people’s everyday lives. It’s a problem associated with the ease of supply and people’s expectation that medications will always be easily accessible.
Medication non-adherence is a complex and major public health issue with significant health and economic consequences – it is well-known that adherence and persistence (continuing to take medications for the recommended duration) affects treatment efficacy, costs, adverse event rates and the severity of disease related sequelae, overall health and quality of life (Kadambi, 2012).


In New Zealand, the conservatively estimated cost of non-adherence is $700m or about 5 per cent of total healthcare spend, mostly relating to unplanned and avoidable hospitalisation due to people not taking medication as prescribed.

Non-adherence is also associated with immense personal and societal costs beyond the financial, in the form of compromised quality of life, lost productivity and untimely death. These downstream effects are particularly tragic given their preventability.

Non-adherence occurs at various stages in the medication supply chain from when the prescription is provided but not filled by the patient at a pharmacy, to being picked up but not started, to not being finished (see figure 2.0).

There are many reasons for non-adherence, some of which include:

- Patient perceptions of their condition, the need for medication and importance of adherence – this relates to: the importance of clear communication between clinicians and patients to transcend difficulties with health literacy; and the importance of how patients view their disease and treatment, which may not be the same as biomedical understandings.
- Patient’s coping style in relation to their condition, with those experiencing denial less likely to adhere.
- Self-regulation – downward adjustment of doses by the patient is a major factor in “non-compliance”, and is caused by patients’ concerns regarding the medications themselves (Pound et al, 2005). Patients will imprudently discontinue medications for a wide variety of reasons (Ruhoy & Daughton, 2008):
  - Some will think their condition is resolved while others may think the treatment is ineffective, accounting for
Studies indicate non-adherence could be a lot higher than estimated because patients may be reluctant to disclose episodes of non-adherence to their doctor due to embarrassment or fear of criticism.

In other words, after receiving a prescription, there is a dual role where patient decision-making and access, and physician engagement, can affect each of the stages shown in figure 2.0. Each one is important and high non-adherence rates show a large gulf exists between the utility of a given medication as perceived by the physician and the realized welfare of the patient (Ellickson, Stern & Trajtenberg, 1999).

Surprisingly, research also shows the seriousness of the condition doesn’t necessarily encourage greater adherence with non-adherence pervasive in areas such as: immunosuppressant medication to prevent organ rejection after transplant, glaucoma medications to prevent vision loss or blindness, HIV medication to prolong life and adjuvant therapy to prevent cancer reoccurrence (CapGemini, 2012).

- Side effects may also encourage a patient to stop medication
- Dosing schedules may be too complex or inconvenient
- Cultural influences on medication taking may include non-adherence due to lack of trust in Western medicine, or cultural values where women prioritise the needs of their families over their need to take medication everyday
- Forgetfulness due to life demands and other priorities, probably common at times for everyone


This is where medication adherence breaks down

-12% -12% -29%

100% 88% 76% 47%

Not Filled Not Started Not Finished

over half of the cost due to waste (Morgan, 2005)
For an observer it would seem illogical not to take medication for a condition that if untreated will lead to a serious decline in health and potential death.

**the seriousness of the condition doesn’t necessarily encourage greater adherence**

However, this would ignore the all-important role of psychology in people’s non-adherence to taking medication now for a health related pay-off in the distant future. In some cases, taking medication simply reminds people they are sick.

Even with interventions targeted at the psychology of medication taking it would be unrealistic to think medication adherence could be eliminated but it could be reduced. Even a 20 per cent improvement in New Zealand would mean a $140m saving on the total estimated cost of non-adherence of $700m, which would fund a lot of additional care.

**taking medication simply reminds people they are sick**

Addressing the causes of medication wastage, non-adherence being one, could improve therapeutic outcomes and reduce morbidity and mortality (Ruhoy & Daughton, 2008) as well as reducing the cost of healthcare.

Despite the importance of adherence and its profound effect on outcomes, historically it has been incorporated into economic modelling infrequently and has been considered in only a cursory manner in those instances where it is addressed (Kadambi et al, 2012).

More focus and investment on improving adherence would have the potential to have significant economic benefits.

Improvements in adherence are a win/win for all stakeholders with regard to medicines, patients, hospitalisations and medicine manufacturers. Provided a patient is prescribed the correct medicine at the right dose, actually taking it on time every time should result in the patient receiving the intended benefit.

Anna Stove, General Manager, GSK NZ Ltd
SO WHAT IS THE COST OF MEDICATION WASTE?

There are two principal costs: those related to unused medication, or waste, and then the significantly larger cost associated with providing secondary care to non-adherent patients.

In New Zealand, there is an $800m annual spend on pharmaceuticals, and an estimated $40m cost from medication waste, or five per cent. Based on figure 1.0, $40m would fund a significant number of additional health services.

Research in other countries has found medication waste, or the non-intention to take leftover medicines prescribed within the past year (Morgan, 2005), to be modest per individual but significant when a total population is considered.

For instance, a US study found medication waste cost US$30 for each retirement home resident over 65 years. This sounds modest but extrapolated out nationwide and the total amount would be over US$1bn (Morgan, 2005). While significant this is minimal compared to the cost of avoidable secondary care for non-adherent patients.

There is also a cost to the pharmaceutical industry due to impacts on two revenue streams: people not picking up their prescribed medication in the first place and not continuing to take their medication for the duration of the prescription. Most critically, the latter impact also leads to reputational risk for pharma companies as their medicines are not being used in a manner to optimise the best outcome for the patient.

If doctors and patients used prescription drugs more wisely, they could save the US healthcare system at least US$213bn a year by reducing medication overuse, underuse and other flaws in care that cause complications and longer more expensive treatments (Johnson, 2013).
According to CapGemini estimated revenue lost by the pharmaceutical industry in the US alone due to non-adherence to medication for long-term conditions is US$188bn (59% of the $320bn in actual total revenue, or 37% of the $508bn in potential total revenue). Extrapolated globally, pharmaceutical revenue loss is estimated to be $564bn annually, more than 18 times higher than the $30bn most often quoted to date (CapGemini, 2012).

Pharmacy revenues are also affected if patients do not pick up medication initially or over the course of a long term condition.

Medication non-adherence also significantly increases healthcare costs as a result of disease related complications and improved adherence is a clear win-win for all, most importantly for patients, who benefit from better health and quality of life (CapGemini, 2012).

**improved adherence is a clear win-win for all**

A US study provides a clear illustration of the potential savings from the effective taking of medication post-chronic heart failure. It found for every dollar of medication taken there was an US$8.40 saving downstream including reduced hospital stays and visits (Atlantis Healthcare, 2014).

Another report, “Avoidable Costs in Healthcare”, by IMS Institute for Healthcare Informatics found the biggest area of waste (in the US) is patients not taking medicines prescribed by their doctor, either at all or as directed (Johnson, 2013). It showed more appropriate use of medication, taking it exactly as prescribed, not taking antibiotics for viral illnesses, preventing medication errors and the like, could prevent 6m hospitalisations, 4m trips to the emergency room and 78m visits to doctors and other outpatient care providers each year.

As a significant cost and saving opportunity in any healthcare system, medication and its management needs more research and this is where information plays such an important role.

*medication and its management needs more research*

Clearly, understanding the link between supply and consumption, as well as having robust and accurate feedback, would allow prescribers to make better informed prescribing and volume decisions.
THE IMPORTANCE OF INFORMATION

As the father of modern management thinking, Peter Drucker’s famous saying “if you can’t measure it you can’t manage it”, is now part of management folklore and highly applicable to the management of medication and therefore waste.

If medication usage isn’t measured, there is no information to work with.

In the past, once a medication was prescribed and dispensed, the trail of information ended and with it any ability for it to be managed.

But now with systems collecting non-identifiable data, such as ePrescribing, there is potential to manage medications better, to reduce waste.

Information drives the medication system so without it there are many unanswered questions about the medication pathway such as: how much is being prescribed, is it being used and how much is being wasted?

In New Zealand, the importance of information is being emphasised by organisations established to extract more value from the vast resources of data we now generate. There is a growing understanding about the power of using information to drive efficiencies in many different areas of society, healthcare included.

The New Zealand Data Futures Forum has put forward its approach to drive social and economic value from data based on four foundational principles: value, trust, inclusion and control.

Now as the Data Futures Partnership, a government appointed body, it is promoting high-trust and high value data use for all New Zealanders as a collective effort across public, private and NGO sectors (www.nzdatafutures.org.nz).

In economic terms the importance of information can be measured in the potential cost saving from early identification of at risk patients.

there is growing understanding about the power of using information to drive efficiencies in many different areas of society

For instance, in New Zealand it’s been estimated that treating one person with diabetes over their lifetime can cost up to $1m, with some saying this is a conservative figure. The number of New Zealanders living with diabetes has doubled from 125,000 to 250,000 in the past ten years and it is estimated a further 1.1 million people have pre-diabetes and a high risk of developing the disease (Diabetes New Zealand, 2015).

With these staggering numbers any early detection followed by measures to reduce the risk has the potential to save the country hundreds of millions of dollars.

To achieve this we need to use information more effectively – we can’t afford not to do this. While there is progress in our attitude towards data and its value, in healthcare we are not yet using the data we have today to improve our health for the future.
WHAT MORE IS NEEDED IN THE FUTURE?

Better use of data

The most important aspect of progress needed in the immediate future is the more effective use of non-identifiable information. This alone will help reduce medication waste in the system, along with reducing costs of other aspects of healthcare.

In New Zealand, we already have momentum for this one aspect through systems such as the New Zealand ePrescription Service (NZePS) and the development of a single national electronic health record, announced by Health Minister Jonathan Coleman (NZDoctor.co.nz, 10.10.15).

**we can use non-identifiable information to accurately analyse medication use**

If we can use non-identifiable information to accurately analyse medication use and non-use, by whom, when and where, we can make great strides towards reducing waste. The evidence from other countries using an electronic health record, tells us the better use of information drives healthcare to be more effective. Studies have demonstrated the efficacy of health information technology for improving quality and efficiency (Chaudhry et al, 2005).

Benefits include enhanced delivery of care, especially in the area of preventative health, enhanced monitoring and surveillance activities, reduction of medication errors and decreased rates of utilisation of potentially redundant or inappropriate care (Chaudhry et al, 2005).

**the upstream management of healthcare is essential to produce downstream benefit**

While consumer non-adherence is a significant factor, a strategy to combat pharmaceutical waste should include preventative measures that encompass all facets of drug accumulation and waste (Ruhoy & Daughton, 2005).

**Charting the course to less waste in rest homes**

Electronic medication management for rest homes allows prescribers to see actual medicine consumption records of a patient as well as recording and displaying information from a facility, for the prescriber, in real time. This helps determine not only if a medicine is appropriate but also whether the patient does (or wants to) take the medication.

A system like Medi-Map, developed in New Zealand, has this functionality and results in better decisions on not only what medicine to prescribe but quantities based on actual consumption and feedback about non-compliance and reasons why. It also helps prescribers be more flexible in making decisions about delayed starts or ceasing medications when necessary, which also helps reduce waste.

Greg Garratt, CEO, MediMap NZ
The upstream management of healthcare is essential to produce downstream benefit. This means management moving up the medication supply chain, supported by information and it’s analysis.

More information technology

Widespread adoption of information technology is now regarded as a pathway to improving healthcare (Tang & Lansky, 2005). While dated, this comment is more true today than it was over a decade ago.

There are national systems that can play a role, such as EHR and ePrescribing, as well as small scale patient centric systems such as health apps, texting reminder systems and telehealth support.

There are many envisaged benefits from EHR systems including increased efficiency in healthcare organisation and delivery through: improved data sharing, data quality, security and availability, reduced errors, patient empowerment and time savings for staff (Morrison et al, 2010).

Countries around the world are implementing EHR systems to realise these benefits, in some cases the adoption of health information technology has become one of the few widely supported, bipartisan initiatives in the fragmented, often contentious health care sector (Chaudhry et al, 2005).

Due to the scale of such implementations there’s an evolutionary approach rather than a revolution. Healthcare is also very conservative and complex in nature and comes with significant political involvement so any solutions will have associated hurdles to overcome.

New Zealand’s approach to adopting health IT is evolving; around 16 per cent of GP practices use the New Zealand ePrescription Service (NZePS) after being launched in 2014, while almost all community pharmacies that are on the Connected Health Network are now connected to NZePS. Regarding patient portals, 100,000 Kiwis have signed up to the service after two years of operation. Changing behaviour of healthcare professionals, as well as patients, is needed if we are to make strides towards using information and technology more effectively.

Changing the behaviour of patients and the need for more engagement

In their paper “The Missing Link: Bridging the Patient-Provider Health Information Gap” (2005) Tang & Lanzky talked about patients being the co-pilots of their care.

Eleven years later, in New Zealand there is much discussion about personal control over healthcare
or people being the CEO of their own care. The New Zealand Health Strategy, announced in October 2015, includes "people powered" as one of its five strategic themes.

This approach was supported internationally in 2010 by the signing of the Salzburg Statement on Shared Decision Making, calling on patients and clinicians to work together to be co-producers of health.

**the New Zealand health strategy includes 'people powered' as one of its five strategic themes**

All this points to people having more involvement in their healthcare and working alongside their doctor. Tang and Lanzky say at a minimum patients need access to information from their providers: diagnoses, medications, allergies, lab test results, visit summaries and other findings over time. A continuous healing relationship is a two way interaction (whether electronic or face-to-face) between patients and their providers (Tang & Lanzky, 2005).

**engagement with patients through IT systems breeds better, stronger, closer relationships between healthcare provider and patient**

Engagement with patients, through the use of IT systems is highly important as it breeds a better, stronger, closer relationship between healthcare provider and patient. The transparency delivered by this provides patients with empowerment and control, which helps them understand their health better. A benefit of this is improved adherence.

**Changing Behaviours: physicians and patients**

The Regenstrief Institute paper: “The Promise of Information and Communication Technology in Healthcare: Extracting Value from the Chaos” (Feb 2016) emphasises the importance of physicians and patients changing behaviours to extract the most from health IT. Authors William Tierney, M.D. and Burke Mamlin M.D., say:

“We can’t assume someone else will make the right decisions with health IT. It’s going to take everyone’s involvement, including providers and patients, to raise expectations and drive the needed changes. This isn’t a passive process.

“Getting to a desirable future where health IT is appropriately employed to benefit human health isn’t a technical problem – the technologies already exist. It’s a health policy and sociology problem,” said Dr Tierney.

“Too often, health IT designed to emulate paper processes becomes a distraction to care. The promise of health IT is for it to become a valuable part of the healthcare team, a participant in the conversation. And we as physicians must understand its potential and become active participants in its development or the potential,” said Dr Mamlin.

“As healthcare IT becomes more pervasive, and as technology becomes part of everyday life for a growing percentage of physicians and patients, both stakeholders are becoming more comfortable with the greater amounts of data available and more demanding of its use in support of health.”
The changing behaviours of patients will also need to be matched with increased support from clinicians and doctors for a more patient centric approach to healthcare.

In terms of medication use, one way to achieve more effective adherence will be for healthcare professionals to put more emphasis on the importance of prescription filling, starting and finishing. While appointment times are always pressured, a consistent, simple and strong message to patients about adherence would be beneficial.

There is obvious desire by people to be more involved and engaged in their health, with the growth in development of health apps and technology driven support for all generations.

**Changing perception about privacy**

New Zealand’s Privacy Act has been a mainstay of society since it received its Royal assent in 1993 as a control over agencies collecting, using, disclosing, storing and giving access to “personal” information. New Zealanders benefit from the protection it provides for personal identifiable information, whether digital or offline.

Its key focus is personal information.

Diane Robertson, former head of Auckland City Mission and now Chairwoman of the Data Futures Partnership, commented at her appointment in October 2015 about the public’s perception of privacy: “the issue we have to look at here is the difference between ‘personal’ information and information that is depersonalised with all ‘identifiers’ taken off and used as ‘data’ to give us some better information” (stuff.co.nz, Oct 2015).

Her comments came after a Cabinet paper in August 2015 describing public trust in data sharing as tenuous.

The work of the Data Futures Partnership, and
others in the information industry, should be applauded as it is starting to grow understanding about how information can be used to improve society, healthcare being a vital part.

Clearly there is much work to do for everyone in the information sector to build understanding about different types of information and the need for privacy to be applied appropriately so that benefits from non-identifiable information can be realised.

**More investment in medications adherence**

With adherence being such a prominent area of concern, more research and investment on improvements is essential by both the public and commercial sectors.

There is a clear business case for adherence programmes due to wide ranging impacts of non-adherence.

The pharmaceutical industry does invest in adherence programmes and has increased its spend globally. Medicines companies in New Zealand often undertake adherence programmes.

**there is a clear business case for more investment in the pharmaceutical industry to invest in adherence**

An example of partnership is PHARMAC working with Atlantis Healthcare on its own multi-channel adherence programme for people living with Type 2 Diabetes, with promising preliminary results including: improved perceptions of the disease, improved adherence and a decrease in healthcare utilisation.

For governments any improvement to adherence will reduce hospitalisations and free up beds for those who really need them.

With both commercial and government sectors set to gain from improved adherence, a potential question is whether there’s opportunity for more emphasis on a Private Public Partnership (PPP) approach to adherence?

**is there opportunity for more emphasis on a Private Public Partnership (PPP) approach to adherence?**

No matter what the investment channel to enhance adherence – be it electronic or pharmacist-led counselling – actively encouraging medicine adherence for patients should be one of the priorities in the healthcare sector in New Zealand, and the medicines industry wants to be part of this through well-resourced public-private partnerships.

The benefits of adherence are substantial and the cost savings achieved are in some cases significant, despite what is perceived as more investment being made initially.

In one overseas study the benefit:cost ratios ranged from 2:1 to 13:1 for patients with chronic vascular disease from adhering to their prescribed medicines. These benefits resulted from reduced hospitalisation and emergency department use.

In addition to this, people who adhere to medications become more active and productive and have better quality adjusted life years (QALYs).

Such data and results support the case for policy to promote the better use of medicines to improve health outcomes and reduce spending overall.
Changing the delivery system

We have become lazy with our medication delivery system whereby bulk prescriptions are provided that are convenient for the dispenser and the patient. This ready-as-needed approach maximises the chances the medications will not be needed, eventually leading to expiration and the necessity of their disposal (Ruhoy & Daughton, 2008).

we have become lazy with our medication delivery system

Within the medication supply chain there are major opportunities to prevent wastage and accumulation of medications including: unit dosing, trial scripts, low-quantity packaging of OTC medications, increased monitoring of patients, implementing the practice of concordance, free samples and donations, reducing incentives for excessive purchasing (Ruhoy and Daughton, 2008).

This will mean altering the consumption and behaviour patterns of consumers. Unit dispensing, as opposed to bulk dispensing, has the potential to deliver the correct dosage of drug with the correct timing (Ruhoy & Daughton, 2008).

This raises a question about the economic benefit of delivering medications in smaller batches but more regularly, which also creates more opportunity for patient engagement and the monitoring of non-adherence.

There are challenges with this approach, one being it assumes patients will have the capacity to collect their medication more frequently, and if they don't the result will be greater non-adherence. Also, it does not address the psychological drivers and practical barriers of non-adherence.

Another is more dispensing will increase costs, which goes against the current climate of reduction.

However, both these ignore the potential for more frequency leading to less waste, more adherence and significant savings in secondary care. More regular dispensing could be supported by delivery rather than pick-up or even home visits. While this seems extravagant and expensive the potential savings in secondary care could warrant such an approach.

An example of a business where this already happens is supply chain and logistics where database and inventory technology is very specific. Manufacturing companies are able to accurately estimate demand and potential orders from their various customer retailers and wholesalers. This allows them to produce exactly what is needed, when it is needed (Ruhoy & Daughton, 2008).

within the medication supply chain there are major opportunities to prevent wastage

If only looking at the prescribing and dispensing process, more frequency wouldn't make sense. But if the whole of healthcare is considered then the case could become stronger.

More research into the potential economic upside from a different delivery approach is needed.
LESS WASTE MEANS LESS NEED ACROSS HEALTHCARE

Reducing medications waste is just one of the many benefits resulting from more effectively using information and technology, in addition to many others such as savings in time and resources.

As this paper has shown, it won’t be possible to rid all waste but we can do a much better job at reducing it. The biggest tool to use in this quest is information, followed closely by changing the way medications are managed and people’s attitudes towards them.

Like most western healthcare systems ours in New Zealand is only at the start of transforming into a truly information driven service, supported by technology. As this happens, the traditional view of healthcare is changing as people become more involved and care becomes more patient centric.

This evolution will give everyone a role in healthcare - from clinicians, to patients, healthcare managers and health IT specialists, we are all responsible and we can all play a part.

To be successful we must be focused, as proceeding with this transformation is imperative to the very survival of an effective and affordable healthcare system. There are too many significant issues facing us to do anything else.

Along the way there will be many hurdles including those that are political, privacy related and financial. But we need to place all of these in the context of New Zealand, and everyone who lives here, needing affordable, accurate and efficient healthcare.

To reduce medication waste and the cost of avoidable secondary care, there is a far greater need for more economic analysis and studies on adherence and its funding, alternative delivery systems and how technology can support healthcare. There is urgency for this, considering the rapidly increasing cost of caring for an ageing population and growing numbers of people with diabetes.

There is also need for greater education and understanding about how clinicians, patients and healthcare providers can all work together to deliver a better healthcare service for all. An important aspect of this is behavioural change towards shared care, attitudes to privacy and adherence.

New Zealand is a small country and we do have an opportunity, together, to create a healthcare system that is the envy of the world, where efficiency and effectiveness is paramount, and all aspects of waste are minimised.

If we are able to achieve this, we may even be able to demonstrate the spirit of the saying, “waste not, want not.”


CapGemini Consulting (2012). Estimated annual pharmaceutical revenue loss due to medication non-adherence.


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