

The #TalkingTeeth monograph series

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Calling for open access to Australia's oral health data sets.

Date: January 22, 2014

Marc Tennant, Kate Dyson and Estie Kruger

Many Western democracies are moving to increase the public accessibility of information contained within government data sources. This move is opening raw data sets collected by State and quasi-State organisations to the public with appropriate privacy protection.

Government data, collected with taxpayer funding, is viewed as a civic resource to which public access is encouraged. A diverse range of datasets have become available in open format including weather, transport, ordinance, crime and policing, court sentencing, education and health data.

Providing impetus for this approach is recognition of the significant opportunities for community benefit attainable by opening non-aggregated data to wider public interpretation and analysis, whether by academics, the not-for-profit sector, commercial enterprise or the general public.

This approach enables novel and innovative developments to flourish, a simple example of which can be seen in the rapid proliferation of transport apps that occurred following open access to London Transport data (or Sydney, Perth or Melbourne). In the health arena, the public release of drug cost data in the USA led to the development of apps assisting patients and doctors to reduce drug costs for patients and the community.

Another important impetus is heightened contemporary community expectations regarding the transparency and accountability of public institutions that serve them.

The UK is a leader in open data. In health, wide-ranging data sets are available including national clinical audits, GP prescribing, Accident and Emergency performance data.

Australia's open data processes are in their infancy. Among Australia's leaders in the open data are the Australian Bureau of Statistics, the Bureau of Meteorology and recently, SA Health, which gives open access to real time hospital A&E data.

Our national agency for health and welfare statistics and information, AIHW, is yet to open its data sets to public access. This massive national health resource, compiled over many decades and with many millions of taxpayer dollars, therefore remains under utilised and limited in independent analysis.

As a result, governments, health service organisations, care providers and patients and all Australians are not in a position to receive the benefits that may emanate from more eyes looking at the this very important national data resource.

The implications of this for Australian dentistry are significant since some of Australia's most substantial oral health datasets are held by the Australian Research Centre for Population Oral Health (ARCPOH) on behalf of AIHW.

These datasets include data from the Child Dental Health Surveys and the National Survey of Adult Oral Health as well as dental workforce data.

Much of the substantial dental policy decisions made in Australia over the last two decades (eg dental workforce), as well as much discussion in the scientific literature and the wider professional press, has rested on these datasets, which have essentially only been open to a single analytical team.

Australia is in a critical period of rapidly changing dental landscape with new policy initiatives and greater government dental expenditure, changing the course of both private and public health dentistry.

In this climate, it would clearly advantageous to have as many "eyes", both expert and lay, able to review all available data to help ensure decision-making and advocacy has a collectively determined evidence-based direction.

Is it time for Australians to call for open access to our national oral health datasets in keeping with the wider principles of open access for the benefits it offers our community?

The application of open access to public health data held by State and Federal government agencies is one for governments to make.

Most oral health data, current and past, is held by the State dental services and AIHW, and in reality it will be these organisations that are called on to bring open data policy to the dental arena.

Dental care and policy should be directed towards those who need it most.

Date: February 05, 2014

Authors: Marc Tennant, Kate Dyson and Estie Kruger

The dental health of Australians as a whole has improved meteorically in the last 50 years. In the 1960s, decay was an epidemic, which left almost no child untouched. An average 12 year old had over 10 decayed teeth.

Today, decay is an insignificant problem for most 12 year olds – half of them have no decay at all and only a small minority have high levels of the disease (around 5% have more than 5 teeth affected by decay). This situation could have been only a pipe dream 50 years ago.

But have we completely seen off the serious dental decay problems of our past? For many Australians, the answer is yes.

However, some are left still dreaming about a better oral health future. Overwhelmingly, it is severely disadvantaged and marginalised Australians whom as a group, continue to suffer severe tooth decay at levels akin to those of 50 years ago.

One in three Aboriginal children in remote WA still has to endure toothache, and poor Australians are 30 times more likely to end up in hospital as a result of severely infected teeth than are wealthy Australians.

We need our public policy machinery to keep up with current times in which decay is now heavily sequestered among disadvantaged people. Is the policy focus sufficiently aligned to where the highest needs are – remote areas, poor rural and urban areas, aged care and other marginalised groups?

What, for instance, can be the justification for continuing to fund non means tested school dental programs in contemporary times where decay is insignificant in most children's lives?

Moreover, why would these programs remain untargeted in circumstances where they are struggling to provide effective care for the relative few disadvantaged children whose needs are greatest? Is it time to call stumps on this untargeted approach, which is really a legacy of yesteryears disease pattern?

What reasonable justification could there have been for the establishment of the grossly under-focused Chronic Diseases Dental Scheme?

So loosely targeted, this recent Medicare scheme exceeded its \$300 million budget to become a monstrous \$1.2 billion liability that provided large amounts of un means tested high-end services amid very loose eligibility specifications. This money has been spent without any

measures or evidence of health improvement outcomes. Australians should surely be able to expect more.

Workforce challenges

Workforce numbers can be something of a national fixation in Australian dentistry, especially in times of feast or famine. Australia is emerging from a time of severe dental workforce shortage during a period of world economic contraction. This current situation of economically driven reduced demand for private dental services is exacerbating the sense of workforce over-supply experienced in some capital cities.

There is a danger that the ricochet effects from a temporary strong supply in some quarters may result in inappropriate supply reductions. This risk is elevated in our dental environment, which tends to under appreciate the frailties of workforce predications.

Unforseen issues such as generational shift in work-life balance attitudes will continue to blunt the precision in workforce modelling and at best these models can only be considered a rough indicator of need.

History and has clearly shown us that it is the poor and marginalised, ironically those suffering the greatest rates of disease, who lose out if we get it wrong in our workforce planning.

Australia must focus its attention on targeted initiatives for those who still have substantial need. A number of targeted systems addressing the dental health of marginalised communities have been found successful in Australia and other countries.

Systems that rest on modern young practitioners' views of work are going to be essential. For example, the next generation of dentists have very different attitudes to parenting responsibilities with males taking a more active role and more time off expected.

This, coupled with innovative new ways of getting care to the isolated and marginalised, is going to be the major solution to the next wave of problems facing public dental health in Australia. For example, taking advantage of modern fly-in-fly-out models and effective use of tele-health has been shown to be successful.

Extending the old ways into the future will fail.

The complex challenges of addressing health in marginalised communities is the problem for 21st century dentistry in Australia. We have to stay focused on reducing the gap between rich and poor.

Dental education in Australia “at a turning point”: how to sustain quality improvement?

Date: January 07, 2015

Estie Kruger, Laurie Walsh and Marc Tennant

Dental education accreditation: What is needed to sustain quality improvement for the next 25 years?

For the last half of the 20th century, Australia had just five dental schools all located in the well established “sandstone universities”. All faced significant stresses in terms of staffing and financial aspects of their operations. Dental student numbers were at their nadir in the early 1990s, a factor that contributed to a workforce shortage of dentists at the turn of the century. While each of the five schools then increased their student intakes, the overall pattern of supply and demand did not change dramatically until the development of additional dental schools.

Over the first decade of the 21st century, there has been a near doubling of the number of dental schools in Australia. Notwithstanding this, the discipline remains, in absolute terms, a relative minnow in the Australian tertiary education sector; with 9 schools, less than 250 academics nationally and some 500 graduates each year. In the context of the health professions, these are relatively small numbers compared to pharmacy, nursing or medicine.

The arrangements for ensuring the quality of Australian dental education programs are multilayered. They extend from local quality assurance measures applied within the host university through to professional accreditation organised by the Australian Dental Council (ADC). Historically, the ADC was a composite body drawn mostly from the State-based dental boards, but now with the advent of a nationalised system (2010 APRHA and National Boards) has had to adapt to new directions.

To date, all dental schools in Australia have participated in the process and their programs undergo accreditation with the ADC, with periodic site visits and increasingly arduous annual reporting requirements.

The ADC was not born from gatherings of dental educationalists, nor did it have its genesis in experts in dental school leadership. It was drawn rather from members of dental boards, professional associations and other groups who had a diverse set of goals but who shared a common interest in compliance; a history that continues to be expressed in the structure and operation of the system now.

In its accreditation processes, the ADC uses guidelines that were originally developed some 15 years ago, with one substantive change over that time; namely the addition of Indigenous health (5-10 years ago).

The guidelines that each school responds to are compliance focused, and relate to pre-determined sets of

“norms” across each of some 20 parameters. The newly released re-drafted guidelines retain this philosophy. The overall process re-enforces an attitude of compliance, and arguably stifles innovation and enhancement.

A compliance focus is not about enhancing best quality excellence in systems; rather compliance is a mechanism for risking a fall to the lowest common denominator.

At the core of best practice accreditation philosophy is the focus on quality improvement. Modern health accreditation systems (e.g. ACHS accreditation, and ISO 9000 quality standards) press towards strategic long-term improvements, with systematic goals of achievement across a range of key evolving focuses. All these systems reflect a strong emphasis on ongoing, sustainable quality improvement philosophy.

Dental education in Australia is at a turning point.

Dental school numbers and student numbers have both increased, addressing workforce number and distribution issues. The past decade has been unrivalled in terms of the amount of Federal, State and University funds invested into facilities and programs. The next decade, not unsurprisingly, will be a period of consolidation and reaping reward from these community investments.

It is without doubt a period that should be focused on the core of continuous quality improvement and bedding down the reforms of the last decade. It should foster innovations that bring about real improvement in the quality of dental graduates entering the workforce and ensure the sustainability of all dental schools.

The opportunity exists for accreditation of dental education to reorient itself to reflect the modern philosophy of quality and sustainable efforts towards quality enhancement.

As a starting point, the fundamental philosophy of quality improvement should drive a substantive re-engineering of accreditation in Australia. Basing the re-engineering process around the systematic approaches taken in global healthcare over the last 50 years would be a focus to give guidance to the development of a new way forward.

The new way forward should draw upon the core of experienced senior dental academics in the Australasian region. Site-visit team members should all be dental academics with substantive track records in dental education and/or leadership, rather than a collection of people with limited academic or dental school leadership experience. With the relatively small number of schools in the region, there is a need for balance so that rivalries and conflicts of interest are minimized.

It could be strongly argued, consistent with other health disciplines, that experts in dental education (e.g. the Australasian Council of Dental Schools, as the peak body of dental educationalists) should have substantial oversight of a process to re-engineer accreditation processes. To date this peak body has had only a small voice within the ADC governance and processes.

Looking back over the last 15 years, a fundamental philosophy of compliance and rigid reporting has not led to a wellspring of innovation within Australian dental schools. Equally apparent has been the lack of development of substantive quality improvement systems.

A strong argument can be made that the current path is not (or no longer) the right path. It is now out of step with the focus on quality improvement that underpins the rest of the health sector globally.

The accreditation processes used for dental education has languished for 15 years, and the status quo with its compliance-based approach (even in the recently updated form) cannot bring forth a sustained quality improvement movement in Australian dental schools.

What is needed now is a re-engineered system of quality improvement resting on the global advances made in

health system accreditation, which have been shown to lead to sustained quality movement evolving over the last half century.

The new approach must be comprehensive, and draw on evidence, including that developed by many national and international accreditation approaches. These systems at their core are founded upon transparent criterion based performance measures with an underlying philosophy of “how to improve” not “licencing to continue”.

Achieving sustained quality improvement in dental education is something that all Australians expect and indeed demand of their health professions and universities –and particularly after a period of substantial investment. Merely tinkering with the current system of professional accreditation will limit the extent to which dental education can flourish over the next 25 years.

Rather than evolution, what is needed now is system revolution, beginning with a wholesale consideration of the underpinning philosophy for dental education accreditation. The fundamental objectives of this re-engineering should not be quality control but sustained quality improvement.

The “Inverse Care Rule” still rules in Dentistry in Australia.

Date: January 12, 2015

Estie Kruger and Marc Tennant

The definition of the inverse care law was coined in the early 1970’s [1]. The law “The availability of good medical care tends to vary inversely with the need for it in the population served” defined what has been observed for many years. Today, even after the clarity of its definition, it remains an all-to-often seen occurrence in modern health care.

Modern dentistry is no exception, in fact, in many developed economies, it could be argued that it’s an extreme example of the rule. In Australian dentistry, all the ingredients for extreme inverse care law have been present for decades.

Oral health care is predominately provided on a fee-for-service basis in the private sector. In fact, more than 80% of care is provided in this way. Dentists are, on the whole, small business owners, partners off small businesses, or other types of “employees” of businesses, with the total sector income estimated at near \$8billion per annum.

On a national level we see dental practice distribution reflect the economic drivers. Some of the world’s (and certainly Australia’s) highest densities of dental practices

are in the cores of our major cities, whilst at the same time some of the world’s lowest densities are seen in rural and remote Australia. Even within cities, we see practices clustered around areas of high net wealth.

State governments provide relatively small safety-net care systems. The safety-net service workforce, and thus care provision is fundamentally at the fate of the substantially larger private sector. Income differences between government and private practice are so substantial that there is forever a drain to the private sector. In strong economic times the drain is higher, but even in cooler economic times the drain remains.

One recent study found that newly graduated dentists work in the more marginal economic (and health for that matter) communities of our cities (and beyond), but 6 years post-graduation there is a substantial “migration” back to the wealthy areas of cities.

Over the last half a century substantial reductions in disease burden have been achieved through massive improvements in public, and individual health attitudes and prevention. However in dentistry the effect has, like in many chronic conditions, been most substantial at the

higher socioeconomic strata of society. Oral health, with the advent of community fluoride exposure, is a wonderful example of public preventive strategies being effective, but the effect has magnified remaining differences between rich and poor. We now see only 5% of 12 year-olds with 5 or more decayed teeth, but these children are, in the vast majority, resident in the marginalised parts of society. Whilst at the wealthy end, no decay at all is the predominate status for 12 year-olds.

The collision of changed disease distribution, now substantially skewed to the poor and disadvantaged, and a health system predominated by pay-as-you-go care, sees the Inverse Care Rule, rule.

The well and wealthy have deep reservoirs of care available and most aspects of access to care is “easy”, while the poor and marginalised remain with the disease burden and lack of access to care. Those in the middle are squeezed depending on economic circumstances.

The collision has seen many effects, most notably the dichotomy between the cry for increased need for services and simultaneously the major parts of the professional call for reducing supply of practitioners. In a cooler economic climate where consumers have reigned in their expenditure it is not unsurprising to see demand for dental care in the middle and wealthy sectors of society reducing; thus the call by small business dental practice to reduce workforce. But the poor and marginalised face ongoing hardship with high burdens of disease and issues of fundamental access.

Government intervention has to be aimed at levelling the playing field so essential care for the poor is attainable. Pouring money at the problem at a broad level and without targeting is not effective and history has taught us painful lessons of waste. Systems that diminish the burden faced by the disadvantaged and marginalised are vital. We have to be smart and targeted to remain lean and efficient, whilst simultaneously addressing a substantive community need.

To increase care provision, in simple economic terms, needs approaches that enhance the “buying power” for care of the poor, or alternatively diminish the “opportunity cost” for providing care in marginalised communities. These are the only two efficient ways forward within the current governance framework.

Examples of these economic principles are starting to take hold in Australia. The means-testing of subsidies to access care as is in the new Child Dental Benefits Schedule is a targeting mechanism by enhancing the buying power of the poor. The Dental Relocation and Infrastructure Support Scheme, where practitioners are supported to move to more disease heavy regions of Australia, reduces opportunity costs of providing care in these areas.

In summary, we must strengthen the systems that redress the Inverse care law in modern Australian dentistry. This will reduce overall costs, enhance overall health and strengthen Australia as a just society.

1. The Lancet, 1971:297;405-412 doi:10.1016/S0140-6736(71)92410-X

Dental Care in Australia: We truly live on a very uneven continent.

Date: March 10, 2015

Marc Tennant and Estie Kruger

Australia has a complex population distribution that makes the design and sustainability of many community services difficult.

The provision of dental care in Australia is predominated by a free-market, small business model. The safety-net government dental services only provide 10-20% of adult care. This service arrangement has facilitated Australia to remain, on average, a very healthy society compared with much of the world.

However, Australia is not made up of 22 million average Australians. An average Australian is a statistical fantasy that in reality does not exist. Australia comprises 22 million people from a diverse range of economic prosperity, and towns and cities.

We are becoming more economically polarised with the rich becoming richer and the poor becoming poorer. This is not surprising as it is happening across the OECD.

Not only are we an economically diverse community, we are also one of the most unevenly geographically distributed populations on the planet, with a growing trend that is seeing a slow loss of population in rural and remote Australia.

These two factors, economic disparity and population distribution are at odds with the current free-market predominated dental provision model. And, the effects are becoming more clearly visible and are growing in severity over time. Economic and geographically marginalised communities, are missing out.

Clearly, in a free-market, dentists will work where they want and they have practices that match the economic

reality of their business models. No dentist is going to set-up practice where it's not viable.

Economically marginalised communities miss out. Recently it has been reported that the poor suffer facial cellulitis (usually caused by dental related conditions) some 500 times more than the wealthy. While at the other end of the scale, the rates of wisdom teeth extraction are many fold higher in the wealthy than the poor.

The story is no different for geographically marginalised communities. The geographic cores of our capital cities have some of the highest densities of practices ever recorded, and this clustering is astonishing. For example, you can stand on the roof of the main post-office in Perth and from this vantage point see over three quarters of all dental practices in WA. In other research we have shown that nationally, in suburb terms, we have about a 40 times difference in population to practice ratios between inner city suburbs and regional areas.

To address these disparities is simple in words, but hard in practice; get more dentists to work in economic and geographically marginalised communities.

The federal government has tried on a number of fronts with varying success.

A world-class outcome was the development of a series of new rural-based dental schools; these already see growing numbers of graduates practicing in rural Australia. This has been coupled with programs to get more rural students into dental schools and have more rural placements for students of metropolitan dental schools.

Whereas the federal government's effort at supporting private dentists to provide subsidised care to the chronically ill can be at best be called of marginal benefit, and at worst some may call it a wasted \$1 billion.

Geographic isolation can be overcome to provide care. New models of care have been developed in a number of places that have certainly had sustained positive benefit

to remote and Aboriginal Australians' dental accessibility. These models acknowledge the work-life balance issues and economic realities of the free-market by providing visiting services to locations where sustainable standard service arrangements would not work. Australia needs to engage in these new models to effect large scale change.

Similarly, another example is the federal governments Dental Relocation and Infrastructure Support Scheme that provides a second path to address geographic marginalisation by financially supporting dentists to set-up in areas of need, through capital and operational subsidies. Clearly, there are innovative ways forward.

State governments are responsible for dental services for economically marginalised communities. These services have the opportunities in front of them to evolve new quality care models. The opportunity is particularly available during a period of increased dental workforce (brought about by the new dental schools) and the opportunity is for them to re-enforce Australia's dental safety-net.

To date, many have been substantially focused on child dental health, but with the substantial inroads made through dental public health, it is time these services make a concerted effort to move to address the new demographic reality of an aging population and the economically marginalised; particularly as Australia continues to become more economically polarised.

The way forward for dental care in Australia is far more complex now than it has ever been before. Dental disease is focused in the geographically and economically marginalised and service systems are substantially free-market driven.

The art and science of future government dental policy will be in balancing this free-market economics with the true social need of Australia in the next 50 years, to ensure Australia remains a just society.

Celebrating successes in oral health and looking to an innovative future.

Date: June 10, 2015

Marc Tennant and Estie Kruger

If this was the 1960's we would be talking about how every child is suffering dental pain and abscesses. We would be talking of massive drives of tooth extraction and how it is better to get false teeth when you are 20 years old than to continue to suffer the scourge of dental pain. But, we are not in the 1960s and this is nothing like the current situation.

Today, dental decay is nothing of the problem it was previously. Why?

The principal driver has been the population level fluoride exposure. In children this has reduced dental decay from an average of 10 decayed teeth per 12 year old, to a current level where statistical averages can no longer be reasonably used.

In fact, prevalence of 12-year-olds free of decay runs at more than 60 per cent and growing. This effect is not limited to children, with the rates of full denture wearing in adults turning around from 75 per cent wearing, to 75

per cent not needing in 50 years, and are predicted to continue to fall to near zero levels over the next 20 years.

However, this demolition of decay through public health has exposed a tyranny of our society—socioeconomic divide (1).

The remaining decay is not even or randomly distributed. Those at the margins of society, or in poverty, have in many cases not seen any real improvement in dental health (2).

Against this relatively rapid swing from universal chronic disease to a very skewed distribution associated with poverty and marginalised groups, we have not seen the concomitant shift in targeted health care.

Dental care in Australia is fundamentally a private model, with small practices, setting prices and locating themselves based on business decisions. This makes up some 80 or more per cent of the total care provided (3). A relatively small state and territory government safety net for the poor provides the remaining 20 per cent. And school dental services in some states remain universal coverage.

Obviously, under a small business model dental practices are at their highest densities in the cores of our cities where people are able to pay the fees for care (or have private health insurance). But this is opposite to where new disease is at its most intense, and a classic example of the “inverse care law”.

Surely the Australian government is aware and has been acting? Yes, however, with a near wholly privatised sector, these levers are limited and at times have consequences that policy makers were unprepared for.

The first lever government has, is workforce numbers. In the late 1990s Australia was training some of the lowest numbers of dentists since World War II (in absolute numbers). The government in collaboration with universities moved to support a change in educational models to provide more opportunity for dental education. This has been a national iconic success. A relatively small input in dollar terms, with a substantial long-term benefit—every policy maker’s dream outcome.

The second lever the government experimented with, was to outsource care for those in need to the private sector. This billion-dollar expenditure was brought to a close (running some half a billion dollars over budget) after it became evident that a number of “interesting pathways” and models of use were occurring (4). Policy makers were burnt. All would agree the principle was good, but the implementation framework left a lot to be desired.

The third lever the government has continued to use, is a small funding program to attract dentists to move from the city to the country. This relatively small, and formal, open-detailed reporting of the outcomes is yet to be available. However, from a policy perspective the principles are correct, but again, it is vitally important that in the economic reality of small-business-led care, its implementation framework be robust.

At the State level (those responsible for the safety net) the level of adaptation to the new disease distribution has been varied. This is especially evident in the operation of school dental services. Casting our eye back to the 1960s we can imagine that a universal—see every child every six months—was a perfectly logical model when extraction and pus drainage was the primary need. More recently, cutting edge school dental services have now moved to being targeted at those child groups of poverty and marginalised children. The days of universal service are behind us.

The vast majority of service and practitioners are private small business models driven by normal economic drivers. With the development of new dental schools (and a parallel increase in International dental graduates receiving registration in Australia) there have been murmurs of workforce “over supply”. Not unsurprising as the economic cooling of Australia in the last couple of years has been coincident with the growing output of new-graduate dentists. Demand for care has dropped, especially for non-essential care (e.g., cosmetic), at the same time as supply has increased. Also, we are at a juncture where the baby boomer practitioners are looking to sell their practices as retirement nest eggs, and values are at risk of falling.

As harsh as it sounds, an argument can be made that a downturn leading to price pressures, and expanding service options, may actually be a reasonable outcome at a population level. The main population-level defence that needs to occur under these conditions is to protect against over servicing. This will be a challenge of the next decade; maybe a challenge that needs to be integrated into accreditation systems?

The next substantive national-level challenge in dental health that needs urgent and appropriate attention is the changing demographic in Australia. We are a rapidly ageing population. Ageing and dental health are complex issues, including the co-morbidity of multiple systemic conditions, the use of many medications which may have side effects that are hazardous to oral health, the diminishing ability to sustain good oral hygiene practices, and lack of access to appropriate care for the elderly, or those in residential aged care (5).

No elderly person should be without access to good oral health.

The need to target other high-risk groups will remain at the forefront of Australian dental public health for decades to come. The days of universal “one-size-fits-all” approaches are gone. Disease and suffering are not evenly distributed any more. Australia’s complex geographic and demographic spread is going to require novel systems of addressing the oral health needs of people at socioeconomic disadvantage and those distant from the cores of our cities because these are the people who do, and will continue, to suffer (6).

State systems have to adapt to address these needs, and the successes of the last decade are exemplars of tailored solutions that can, under all sorts of economic conditions,

sustainably address complex issues for marginalised (geographically, socially, and economically) groups (7). The solutions are achievable within the constraints of Australia's dental healthcare system, we just need to innovate rapidly. Visionary leadership that has a strong connection to evidence-based public health research is essential.

Australia has come a long way in addressing dental ill-health; however, many problems and risks remain. We are not at the end, but achievements of the last 30 years should be celebrated. Strategic, expert-led reflection on these past efforts in order to drive the next wave of evidenced-based innovation must be focused on an inclusive, all-of-society agenda, particularly with the shifting pattern of disease burden.

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Quality in dentistry in Australia: Essential or volunteer extra?

Date: September 10, 2015

Estie Kruger and Marc Tennant

In the last few months in NSW some 11,000 people have received very disturbing letters, outlining the serious risk of disease, originating from a dental practice they attended for routine care.¹

Social media comments have highlighted the anger, anxiety and suffering these people endured from this quality failure. Unfortunately this was not an isolated incident, there have been similar occurrences in the past, and this will certainly not be the last.

Dental practice has risk factors that closely align to other interventionist health service providers. For example, dental practices use autoclaves and recycle instruments for use between patients. They therefore need a very strong system of infection control, similar to that required in theatre-based interventions.

Approaches to quality assurance

Over the last 40 years, quality assurance has been a strong and growing area of health policy and practice. This has occurred through a number of different mechanisms. For example, health insurance organisations have generally constructed their policy regimes to ensure care is provided in facilities that have undergone a formal accreditation process.

In the last 5-10 years the Federal government has moved into the area with the development of the National Safety

and Quality Health Service Standards (NSQHS Standards) and the National Safety and Quality Accreditation Scheme, overseen by the Australian Commission on Safety and Quality in Health Care (the Commission). The aim of these standards is to support a consistently high level of safety and quality across the spectrum of the health system.

Public dentistry

Government-funded dental services in Australia are now participants in the National Safety and Quality Accreditation Scheme, albeit some have been a little slower and less enthusiastic than others. State governments have pushed their participation with the clear acknowledgment that there is risk in dentistry and benefits in implementing mandatory safety and quality standards.

This means that public dental services (where scrutiny is naturally higher) also have independent auditors who undertake site visits to comprehensively assess their practices against the NSQHS Standards.

Private dentistry

This contrasts with the situation in private dentistry where the majority of practices are not required to be part of this national system. Unlike public dental services, their participation in the National Safety and Quality

Accreditation Scheme and adherence to the NSQHS Standards is voluntary.

This means that scrutiny of safety and quality in private dentistry is minimal, involving a voluntary system of “desk-top” audits, which are regulated by the Australian Dental Association (ADA), the professional body for private dentistry. The ADA explains its role as follows:

“... the Commission has appointed the ADA in the role of quasi-regulator of the Dental Practice Accreditation Scheme”.

The result of this approach is that Australia, now has a dichotomous approach to safety and quality in dental care. Clearly, this dichotomy for an interventionist, high risk, discipline sits at odds with the rest of the health sector. It is also evident from the recent quality and safety breach in NSW that this approach needs to be questioned.

Where to from here?

We suspect that most Australians would not believe the current ‘two tier’ approach to safety and quality in dentistry is acceptable.

We understand that there are resource implications for private dentistry in increasing adherence to national safety and quality standards.

Quality systems are about reducing risk and risk reduction requires effort and resources. The costs of an accreditation system to dental practices should be seen as part of the cost of doing business, similar to litigation protection insurance.

We also appreciate that these accreditation costs will hit even those professionals “doing the right thing”. But this is the case in all areas of the health system. Continuous quality improvement is not just about picking up safety and quality breaches, it’s about ensuring our health systems continue to improve by reflecting on their achievements to-date and maintaining currency of practice.

To address the current, unacceptable “two-tier” approach to safety and quality in dentistry three main options are at hand:

health insurance organisations could start to call for adherence to the NSQHS Standards to be required in order for patients attending private dental practices to receive rebates for care provided. This has for decades been the applicable model in other interventionist domains of the health system, and is directly translatable to dentistry;

the Commission could take a more robust stance on private dentistry, which reflects its level of risk, and move to strengthen the application of the NSQHS Standards in this area; and the profession could reflect on its responsibilities to society and move to eliminate the current dichotomy by bringing all practices into the wider national domain of quality in health.

As dentistry is a profession that cares for Australia society, we hope that the last option, will be the way forward.

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Making dentistry part of Medicare: an impossible dream?

Date: November 18, 2015

Marc Tennant, Estie Kruger, Ray Lam and Yev Dudko

Historically we have been advocates for dentistry becoming part of Medicare. However, over the last five years our views have changed.

This has nothing to do with disease burden. In fact, the prevalence and economic impact of oral disease remains high. There are also an increasing number of studies associating oral disease to almost every systemic illness in the body.

Why then have our views changed?

It’s clearly a really important issue. The cost of dental care to Australians is high, access for many is limited by income and various other barriers.

The question as to why dentistry cannot simply be covered by Medicare has been asked many times. Surely that seems a very simple and logical solution?

It is more complicated than that, however.

Let us work our way through the reasons for changing our minds and also discuss some alternatives.

We would like to start by stressing that we remain convinced of the importance of equity of access. Former US Secretary of Health, Frank Dobson, once said “inequality in health is the worst inequality of all”.

No Australian should be without good access to dental care, irrespective of income or place. This, as an underpinning philosophy, is an important premise to state and to hold.

Dentistry in Australia costs close to \$10 billion per annum, including personal out-of-pocket expenses, as well as the collection of State and Federal Programs. It’s a “rounded” amount, as the complexity in actually calculating it is unfathomable. Most, however, would concur at a number around this figure.

With some 25 million Australians, this comes to about \$400 pa for every man, women and child. At first glance that does not seem too bad, and if we could all put in \$400, we can create a fund to cover the dental costs of all Australians? No, it’s not that simple.

Only somewhere between 20 per cent and 50 per cent of people go to the dentist in a given year. So, if we suddenly announce that dental is covered by Medicare, we could hypothesise that more people would turn up; the demand would be much higher.

Let’s say we double the “turn-up”; a not unreasonable scenario – we could certainly argue that it could be even higher. So the total now goes from \$10 billion to \$20 billion, and the cost per man, women and child now goes to \$800 pa.

An average Australian household (2 adults and 2 and a bit kids) would now have to put in \$3,500 per year. We can start to hear people groan now.

Let us be clear: Australian households are already straining under far smaller numbers than that. If we continue the scenario, we could also hypothesise that about half the Australian population has health care cards/pension cards or find it tough to pay the bills. A recent survey indicated that many Australian families found it tough paying a one-off \$150 health bill.

Given that one single dental visit averages over \$200, it is not surprising that affordability of dental care has always been a concern. So we need the well-off to subsidise the not-so-well off. What could that look like? At the extreme edge that could be that half the families of Australia pay \$7000 pa to support the national dental scheme.

We suspect people are now starting to see this is not going to be politically palatable.

How does this number compare with other things?

The \$20 billion per year is higher than the entire proposed National Disability Insurance scheme (NDIS). And the total Medicare levy income is about \$10 billion per annum.

So to have a dental scheme would need something in the order of a doubling/tripling of the Medicare levy (or some other sort of tax funding arrangement). Is that a politically palatable outcome? We are not sure that is achievable.

But that’s the financial side of the story, what about practically?

We should stop here and reflect on the current structure of dentistry in Australia. More than 85 per cent of care is provided by independent private practice dentists in some sort of fee-for-service arrangement between themselves and their patients.

There are no price controls, it is a free market economy. What would happen if the government turned up with a Medicare plan? Clearly, price fixing (ie “you must charge the government rebate”) is not an option for the government. That’s something that is way beyond what could happen in an economy like Australia.

So it would be a rebate to patients – meaning a gap would remain! And, how would that gap-fee be determined? By the free market. So, let us be clear, the efficiency of the government rebate in terms of care provided would be low and would have the tendency to continue to be eroded over time.

There has been one experiment with Federal subsidies to private dentistry and that was closed with a massive budget overrun and much questioning of the outcomes.

Nonsensical as it may sound, pouring more money into health does not necessarily relate to better health outcomes.

But even more questionable is the issue of increased demand: if those currently not accessing care actually came to demand care, we could have a situation where the system would not cope.

In fact, if this was a “budget night decision”, the system would collapse under the load. We don’t have the workforce, capital, or systems in place to actually manage all the latent needs for dental care.

In the small State level systems (less than 15 per cent of all care), if suddenly the patient pool tripled (a not crazy scenario), there would be wait lists of lengths unheard of in history!

So the “make dentistry part of Medicare” seems a near impossible dream and at best an improbable ask and something that Australia in its current (and foreseeable future) structure could not accommodate.

What is an alternative?

We are at a perfect moment in time in that sense.

Workforce shortages have diminished. Dental disease in Australia has a strong linkage to poverty. We have State-based safety net systems designed to provide care for those in need.

If Australian society wanted to make a timely difference to the dental health of Australians, start with a rapid up-regulation of government sector dentistry. Let’s look large (eg quadruple the sector). The cost would be

relatively tiny compared to the Medicare numbers, the efficiency of the expenditure would be far higher than subsidies in an uncapped fee-for-service model.

A systematic up-regulation of the government sector, addressing the poorer members of the Australian population first, as well as those with access difficulties,

the aged and infirmed and then slowly expanding outward could address Australia's oral health in a controlled manner.

Just as importantly, it would also re-balance the 85:15 (private:public) power base of the wider sector to provide Australia with more balanced perspective on the future.

How to improve the standard of dental care to Aboriginal and Torres Strait Islander people?

Date: January 17, 2016

Cathryn Forsyth, Michelle Irving, John Gilroy, Stephanie Short, Estie Kruger and Marc Tennant

On graduation we expect that dental professionals will be able to identify oral health problems and intervene to improve the health of individual patients, as well as the wider community.

Sadly, significant health disparities between social groups in the Australian community persist, despite efforts to reduce such disparities. Aboriginal and Torres Strait Islander people suffer substantially greater burdens of both general and oral disease, which is measured principally in terms of number of teeth lost due to decay, gum disease and injury.

A 'cultural competence' curriculum framework has been recognised as a strategy to improve health outcomes for under-served, vulnerable and minority populations. Cultural competence is defined (Cross et al., 1989) as:

"Congruent behaviours, attitudes and policies that come together in a system, agency or among professionals and enable that system, agency or those professionals to work effectively in cross cultural situations."

During the early 2000s, cultural competence became integral in higher education and health service delivery within the United States; however, it has taken time for this shift in focus to filter through to Australia.

At the University of Western Australia in 2007, the team at the Centre for Rural and Remote Oral Health (now the IRCOHE) recognised that a cultural understanding of Indigenous peoples' experiences and the multi-factorial reasons behind health disparities should be part of dental training and important to future dental practitioners in Australia.

As a result, a collaborative working group was formed to design an Aboriginal and Torres Strait Islander cultural competence curriculum framework for dental students.

To our knowledge this is the only Indigenous dental curriculum framework that has been devised to date anywhere in the world.

In the years that followed this early work, despite standards being included in the accreditation system for

many dental schools, there has been little academic advancement in the field.

Systematic review coming soon

An interdisciplinary team of academics from the University of Sydney (including the authors) has picked up the baton, and is conducting a systematic review of Indigenous cultural competence in dentistry and oral health higher education that will be published in the near future.

The interdisciplinary team from Sydney has future research aims to further develop and analyse current Indigenous cultural competency within curricula delivered in dentistry and oral health programs across Australia.

The plan is to work with communities and dental schools to explore what helps (or hinders) dentistry and oral health students from understanding Indigenous culture, including the systematic hindrances to a wider involvement inculcation of cross-cultural learning in dental education, and to identify new ways of teaching and learning that enables students to become culturally competent upon graduation.

It is noteworthy that efforts to include Aboriginal and Torres Strait Islander people in dental education and as practitioners in Australia has been well below the achievements in other disciplines. It is fantastic to see recent advancements in active recruitment and support starting to redress the imbalance but there is still a long way to go.

Traditionally curricula for dental students have a strong emphasis on invasive restorative and surgical care (drilling and filling). A sustained shift in the educational paradigm in dentistry is going to be vital to re-direct attention to preventive disease management, risk assessment and cultural competence.

The principle of this R&D program is to learn from the processes initiated back in the early 2000's and to advance this into new paradigms of learning right for the 2020's.

In Australia, dental education has gone through substantial change in the last 15 years, with a near doubling of dental schools in Australia and many of these having a stronger focus on targeting communities in need.

The Government's funding of new schools based in rural and remote Australia has sent a message to the profession that a focus on society and communities in need is a critical element to dental education.

Improving practice

Health practitioners need to be more cognisant of the complex issues faced by Aboriginal and Torres Strait Islander people. Practitioners are expected to make reforms to their own practice, as well as drive the reform of systematic issues in the profession. This is going to be integral to closing the gap in health outcomes.

These efforts at curriculum reform aim to create changes in attitudes that percolate through future generations of

health practitioners. This is part of a wider multilevel strategy to address marginalisation in Australian society.

The establishment of the University of Sydney's Wingara Mura Bunga Barrabagu Indigenous Strategy indicates that this paradigm shift is in progress, with Indigenous cultural competence being integrated into all faculty curricula within the University of Sydney.

It is evident that despite embryonic efforts to stimulate strong cross-cultural learning and focus within dental education, the continuance of the effort has not been strong.

The re-emergence of an inter-disciplinary collaboration to revitalise the effort is something that we hope will find support from other health disciplines and also be watched and learnt from by other dental schools in Australia.

Success in closing the health gap relies on all practitioners being cognisant of the specific needs of Aboriginal and Torres Strait Islander people.

Canberra: dental health's 'relative zero'.

Date: February 24, 2016

Inderjeet Sohal, Estie Kruger and Marc Tennant

Australia has some really interesting public health experiments that happen spontaneously, due to the nature of our distributed geography. "Experiments" that were never really experiments, but turned into neat vignettes of the advances we have made in health, and also provide indicators for the future directions.

Canberran children's teeth are just one such case.

What an interesting place the Australian Capital Territory (including Canberra) is. With a total area just over 2000 square kilometres, it is a relatively tiny, self-governed area of Australia. It is fundamentally a single city Territory, with a total population approaching 400,000 people.

Census data (2011) reveals what is most evident of the population: it is extremely warped to relative socio-economic advantage, or "wealth". Over 90% of the population is in the wealthiest 30% of the Australian population and only 0.3% are from the poorest 10% nationally. Even more extreme is the relative distribution when you look at school age (0-14 years inclusive).

dental

Being such a small Territory has advantages. Reticulated water supply is extensive with nearly 100% of Territorians having access to reticulated water. Since 1964 water fluoride levels have been managed to be optimal for dental health, in accordance with the Territory public health Act, and in keeping with federal recommended guidelines.

Territorian school children have access to a universal school dental service. At highly subsidised rates the government service is accessible by all children right through to 14 years of age. This service has been active for many years and provides preventive, basic restorative care and a monitoring system for referral if specialist services are needed.

denatl 2

And, on top of this government care open to all, if a family chooses to use private dental services for their children, then the ACT has a good distribution of private dentists. Unlike rural and remote Australia, Canberra and its associated areas have a number of private practices (Tennant and Kruger 2013)* and now the federal government provides a subsidy scheme to allow children subsidised dental care through these access points.

A wonderful natural experiment

If we reflect back on dental decay and the key public health indicators of disease risk in a population, poverty, access to appropriate fluoride concentrations, and access to care, there is arguably not a more positive enclave of optimisation of these variables anywhere in the world. Canberra is a wonderful natural experiment of public dental health. A highly wealth skewed population, fundamentally fully covered by optimised water and having access to highly subsidised care.

The core question is: how good is the dental health of children under these conditions? Surely with these variables maximised we must be at Absolute Zero?

Interestingly, no. The prevalence of dental decay (ie the proportion of children [12yo] with decay) hovers around 45%, and the incidence (ie the amount of decay suffered by each individual) hovers around a DMFT of 1 (Ha et al., 2011)*.

Clearly, an argument that we have talked about more recently is that the measures are probably not ideal when decay has diminished to such a low level in a population, but at this stage these are the measures the governments of Australia continue to support. We can also argue that we might not like the sampling systems of the data too.

But, putting aside the technical arguments, what we do see is that there is no such thing as Absolute Zero when it comes to a chronic, complex, and multifactorial condition such as dental decay. There is never going to be “the last case” as was seen with smallpox and alike. When this is accepted you then move to a framework of relative zero.

Is it time that we say: “Canberra you are have reached relative zero for dental decay in children, and we refocus our efforts to other subgroups that need advancing”. Do we, as a nation, set a relative zero mark and celebrate when we achieve that line? This does not mean stop, (to sustain relative zero still requires effort), but at the same time the cost-return of trying to push from relative zero to absolute zero could be argued as not a good use of limited resources.

Relative zero

So if we take Canberra as the line of relative zero, how does the rest of the nation stack-up? Data that many of

us do not agree with, nor consider reasonable (for discussions elsewhere), but were measured on the same parameters and processes as in Canberra, brings us to prevalence data as seen below. Incidence data is not that different between States and Territories either.

In summary, we all appear not that far away from Canberra now. But the devil is in the detail that is not included these measures. Such enormous strides have been made for the vast majority that it now masks the few. But, that’s the point. Let’s celebrate the grand success of two generations or more of effort to address childhood decay and target efforts to specific subgroups.

Canberra is a wonderful dental public health “case study” that clearly gives us insights into the achievement of relative zero. A line in the sand for celebration. We need leadership to look, learn and move on to new innovations that advance the health of those that remain at risk.

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Sugar tax: Hopewood House revisited.

Date: May 31, 2016

Marc Tennant, Kate Dyson and Estie Kruger

Dental professionals the world over will recall studying ‘Dental Public Health 101’, a subject which invariably makes reference to two quintessential sugar and dental decay studies from “back in the day” – ‘Vipeholm’ [Ref 1] and ‘Hopewood House’. As a dutiful student of the 1980’s, I learned them by rote, passed the exam (just), and with a gaze affixed on the future, promptly burned all my notes in the ritualistic manner of many a university student.

Hopewood House ‘experiment’

Now, ironically, some 35 years later, as lessons from ‘Dental Public Health 101’ rise like Lazarus amid discussions of a sugar tax, I am fascinated to (re)learn that the Hopewood House experiment is actually Australian. Reacquainting myself with the story of Hopewood House, I dig a little deeper second time around and am surprised by some intriguing revelations.

Amazingly, Hopewood House still stands as an actual house in Bowral, New South Wales. Currently a wedding and event venue, it was recently on the market (if you have a lazy \$7.5million, perhaps you could still obtain this slice of dental public health history).

During WWII, Lesley Owen Bailey, a wealthy philanthropist, opened a somewhat unconventional “orphanage” system, with its primary base at Hopewood House. Some 86 children lived their lives, from before birth until the coming of age, in the care of Owen and his staff. The key word here is unconventional; it’s a complex story and has been described elsewhere as a social experiment and Eugenics.

I can be sure few of us would want to go so far as adopting the dietary regime of the Hopewood House experiment. In fact, it has been troubling to discover on revisiting Hopewood, that the total calorific intake of the children was reportedly below recommended levels for

extended periods and the children were below average in growth percentiles.

A grand vision

Although there were attempts by authorities to intervene, this is certainly not a story of pure altruism and the story certainly has many elements that are out of step with contemporary values. Indeed, the Hopewood children, now of mature age, have suffered schisms in their views of their own upbringing, with some pointing to abuse, both physical and sexual.

Bailey's grand vision was raising strong healthy people able to protect Australia. One of Bailey's focuses was the benefit of a strict, healthful diet. The children's diet was tightly controlled and high in fresh foods, salad, nuts and vegetables and very low in refined carbohydrate and sugars [Ref 5]. Bailey had experts, including a group of dental experts, regularly assessing the health of the children.

Lower levels of decay

Despite the Hopewood children having poor oral hygiene, they had far less tooth decay than similar aged children attending NSW State schools. As 12 year olds, almost two thirds of Hopewood children had decay-free adult teeth at a time when nearly all State school children had decay (For teeth enthusiasts, Hopewood's 12 year olds averaged 1–2 decay-affected adult teeth whilst State school children averaged over five times these levels with 9–10 teeth affected by decay [Ref 2].

As the children grew older and began earning wages, their adherence to a strict low-sugar diet waned and decay levels rose sharply (6–7 decayed teeth by age 15 and 12–13 decayed teeth by 18 years of age [Ref 3].).

Hopewood's legacy

The Hopewood House story forms part of the foundation underpinning the principle of reducing dietary refined carbohydrates to enhance health, and more specifically dental health. The current sugar tax debate is focused on reducing obesity, and rightly so, with developed countries, and now developing countries facing this epidemic.

However, reducing refined carbohydrate intake would also be expected to improve dental decay levels which remain high among some groups. However, it must be remembered that the effect will never be as dramatic as that seen with the Hopewood House children living in an era prior to widespread fluoride exposure.

Footnote: For a more in-depth understanding of the overall nature of the "experiment" a thesis and subsequent article by Dr. Deborah Ambery are excellent reading [Ref 4]. None of which I have any recollection of being told about as a student! And it is far more important than the dental story.

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Does a UK study point the way to more, cheaper dental checkups?

Date: June 24, 2016

Marc Tennant, Estie Kruger and Yev Dudko

In 2015 the world's leading dental scientific publication, the Journal of Dental Research quietly published a paper that has the potential to send shockwaves through the traditional models of dental care.

A group of the global leaders in dental public health have put the "dental check-up" up for debate, calling into question the model of dental care that we have known for 100 years.

So what did their lovely piece of work actually question? Very simply they asked: could a mid-level dental provider (for example, dental hygienists/therapists) do a check-up for dental decay and gum disease at an accuracy level equivalent to a fully-fledged dentist?

Why would this be a controversial question? Well, check-ups (or routine dental examinations) are completed by dentists and correspond to a substantial amount of time spent by these expensive and highly skilled clinicians (see more detail below).

The argument is that if a mid-level provider can do the same (or nearly the same) check-ups as a high cost, highly trained provider, then we have a way to move forward to a more cost-efficient model of care.

The study was conducted in the United Kingdom but is relevant in Australia, where both dentists and mid-level providers (therapists and hygienists) have equivalent training levels as in the UK. Dental decay and gum disease is no different to diagnose in different countries

and cost remains a major issue for the community, as well as the State provided care models.

The study involved nearly 1,900 patients from 10 practices and ran over about 12 months. Each patient was examined by the dentist and the mid-level provider separately, with each taking about the same time (5 minutes) to do the routine examination. This was a “real life” test of the idea, not something done under perfect laboratory conditions.

Under the study, there was little difference in diagnosis between the dentist and the mid-level providers. The difference was worth noting but not alarming.

First, the study found that mid-level providers recommended eight more patients out of every 100 for care on the basis of a false positive diagnosis of decay.

On first glance, those numbers appear high, but remember at the end of the day these patients would be seen again by the dentist who was going to do the end-point care and who would have re-checked and not embarked on the filling if it was not needed.

So this is not so significant.

More interestingly, there was decay detected by dentists in 35 of each 100 patients, but seven were missed by the mid-level providers. This, for experts, is a sensitivity and specificity of 0.81 and 0.87. The gum disease check-up followed the same pattern. Those seven people with decay are important but the authors remind us that (like many diagnostic procedures in health) screening even by dentists alone is not 100 per cent perfect every-time and dental screening is something that is repeated regularly and this remains a key protection in systematic health care.

Implications for dental practice and health systems

So what does this mean for our health systems? Mid-level providers could allow our health system to reduce costs (in particular in the government sector) and thus extend access and reduce wait times for routine care. It is quite imaginable that this paper could lead governments to start thinking about mid-level providers being the check-up team that monitors a population’s oral health and refers to more expert providers. Now, clearly there is more to check-ups than just dental decay and gum disease but the paper starts the discussion of a new structural foundation to the design of dental health systems.

As the authors report, in the UK about a half of all NHS care is taken with up with routine examinations. This is some 13 million routine adult dental examinations – of which, they estimate, about a quarter are for high risk patients. Even eliminating the high risk patients (who must be seen by a dentist) a new model that puts mid-level providers at the core of the check-up system could see some 10 million routine adult dental examinations provided at a significantly lower cost every year. We are now talking big savings and the release of resources to address more pressing issues that require higher-level skills.

Of the dental public health papers of 2015, you can see why this one stands out as having the potential to re-design dental care. Making a dental system more effective and efficient is a vital part of society’s protection against one of its most pervasive disease burdens, and something that in Australia alone costs \$10 billion per annum to treat.

Opportunity for change is here, particularly in the context of an election campaign where new policies are abounding. Making a fair and just system, with robust evidence-based science underpinning the decisions, is vital to our future.

Primary care: a toothless tiger in dental prevention?

Date: August 31, 2016

Estie Kruger, Alaa Alsharif and Marc Tennant

Potentially avoidable hospitalisations are “those hospitalisations which could have been avoided with access to quality primary care and preventative care”. [1]

When it comes to dental health, they can include the following conditions (as recognised globally and by the AIHW):

dental caries

other diseases of the hard tissues of the teeth

diseases of the pulp and periapical tissues

gingivitis and periodontal diseases

other disease of the gingival and edentulous alveolar ridge

other disorders of the teeth and supporting structures

cysts of the oral region

stomatitis and related lesions

other diseases of the lip and oral mucosa

But how many hospital admissions do we actually see in Australia due to these conditions, and what proportion of them are actually preventable?

It’s a complex question. ‘Hospitalisations’ in dentistry extend well beyond the narrow definition offered above and many (actually the majority) sit outside the scope of what’s considered ‘preventable’.

In Australia, the total number of hospital separations (i.e. completed episodes of care) for dental-related conditions is in the order of 200,000 per year.

Of these 200,000 separations about 120,000 are for impacted teeth: wisdom teeth predominantly [5]. Australia has one of the highest rates of hospitalisation for impacted tooth extraction in the world. Ten times the UK and seven times France [6].

Clearly, these are avoidable, but strictly speaking they don't fall within the definition of preventable hospitalisations. Why? Because it's not primary care that will prevent these, but the application of evidence-based guidelines (eg NICE guidelines) for the referral of these cases to hospital in the first place.

In round numbers that's 60% of all dental separations that are not counted as preventable (in fact enhanced primary care could actually increase dental hospital admissions, but more on that later).

This is not to say that good policy and good governance won't make a substantial difference in admissions. This is the real elephant standing quietly in the theatre corner.

A tale of two caries

As for the next-largest, we estimate that some 60,000 separations per year are for dental caries and associated conditions [5].

It's immediately clear that these are preventable with good primary health. But there is much more to the story; the devil is in the statistical detail.

Some of the highest rates of caries are in the most affluent parts of the country, many with full insurance coverage, thus having gold-class access to primary care already.

Nearly two thirds of cases in WA are treated in the private sector, half with insurance and half from the most affluent 40% of the population [6]. And, 80% are from the city and associated areas where prevention such as fluoride is optimised and service access is outstanding.

Given this, the question is: if we drive more primary health services are we really going to dramatically reduce admissions?

It is important to understand the association between primary health care and preventable hospitalisations.

Previous studies have identified that this relationship is not linear but U-shaped, with too little primary health care leading to an excess of hospitalisation, and too much also driving an increase [7,8]. This relationship was found to also apply to dental conditions, with high rates of hospitalisation among poorer, rural, and Aboriginal groups (those with limited access to primary oral health care), and high rates also seen among higher socio-economic, non-Aboriginal, and urban dwelling groups (with good access to primary health care) [9].

There are differences in the mix of conditions however, with more disadvantaged groups more likely to be admitted for pulpitis, cellulitis and periapical disease (possible result of untreated caries), and least

disadvantaged groups more likely to be admitted for caries (diagnosed in primary care and referred for treatment under general anaesthesia).

A strong argument can be made that there are factors other than primary care access driving some of this demand for hospital time and space.

We have previously discussed the "public health experiment" that is the Australian Capital Territory: a very wealthy population, 100% access to water fluoridation, "everyone" in walking distance of a clinic (a wee exaggeration) — yet dental decay is still present and preventable hospitalisation rates remain in the 2-4 cases per 1000 people band comparable to other states [5]. There is no absolute zero achievable.

Even more importantly, a strong argument can be made that the poor and marginalised are accessing hospital-based care at rates lower than the wealthy.

Under these conditions, targeted primary health care (to those at known risk of dental decay) would actually have the counter-intuitive effect of driving up admissions. This is, clearly, not a bad outcome, but it's not addressing the hypothesis that hospitalisations are prevented through primary health care; rather, the opposite.

The best of the rest

A number of other conditions round out the complete picture of dental-related hospitalisations. These occupy hospital beds and time, but are not technically classed as preventable.

Oral Malignancy: In WA these sinister conditions (excluding lip cancer) account for some 700 admissions per year; extrapolating to Australia this is about 8000. Clearly, enhanced primary health may reduce the "time-to-diagnosis" and thus improve life expectancy from treatment. However, with grim mortality rates ranging from 40% to 60% even under the best of health service conditions, we should continue, no matter the level of primary health care, to expect little change in admissions. [4] In fact, looking at the age distribution of those admitted, one would project with an ageing population this will be a growing group for the next 20 years at least. [10,11]

Jaw fractures: In WA these amount to some 600 admissions per year [12]. Extrapolating to Australia this is about 7000 — in relative terms, tiny to the numbers for impacted teeth (120,000) and decay (60,000). More importantly, these injuries are not strictly preventable through primary health care. Of course they can be reduced through action on poverty, marginalisation and violence in society — particularly by addressing the plight of Aboriginal and Torres Strait Islanders — but one needs to take a very broad view of the definition of dental primary health to be inclusive of these factors. No enhanced primary dental care or prevention is going to reduce jaw fractures. Instead, it is for us as a society to close the gap on the 'causes of the causes'.

Flipping the script

So, to return to our core hypothesis: the reduction of hospital admissions through enhanced primary and preventive approaches.

The big admission load from oral health — impacted teeth extraction — is reducible, as is evidenced by actions in other countries, but it is not through increased primary health care. One could argue in fact, that in the current climate of a “guideline vacuum”, greater primary health care access may increase this number through increased referrals — a boon for the private hospital sector.

The second largest load is dental caries, which could, at a population level, see increased admissions for the not-so-well-off. This may be a good outcome of primary health care intervention, but not a reduction as being contemplated in the present scenario.

So what will increased dental primary health care actually do for hospital admissions, both public and private? We leave the readers to draw their own conclusions, but it must be acknowledged that substantially reducing admissions is unlikely.

Good policy and clear evidence-based guidelines for referral, applicable to all, will make the most substantive reductions. And even then, we have to accept that private hospital admissions from the wealthy (both in service access and assets) core of cities, will continue to distort service utilisation in the economic model of Australian dentistry.

However, if one divorces the discussion of good primary health and prevention from the goal of reducing hospital admissions and views it instead as a quality community initiative, it becomes a very different debate.

Targeted to current gaps in the system, good primary health and prevention will make a substantial contribution to reversing the massive inverse care law effect that the Australian population sees in oral health services.

And that would be something to smile about.

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Lessons from the gaming of waiting lists: reform is needed.

Date: January 03, 2017

Marc Tennant and Estie Kruger

Waiting list clerks sit at the interface of two competing visions of what waiting lists really are.

On one side, patients see them as “when is my turn coming to get the care I need?” On the other side are the darker, more clouded drivers of health organisations.

Let’s not be naïve; for an organisation, a waiting list has all sorts of “opportunities” that can be exploited.

Before we continue, a disclaimer. We acknowledge that waiting lists actually represent pain, suffering and delay for patients and, in some cases, death.

This is the reason we came to write this article, which aims to advance waiting list management and transparency, not to do harm (which is why the anecdotal stories presented below, based on fact, have been modified to protect people and reputations).

Patient perspectives

So let's take the first perspective of a waiting list – the patient's view.

When our name goes on a waiting list, our expectations include: orderly removal (i.e. last on, first off); to be kept informed; for our health to not deteriorate during our wait; and the answer to the obvious question of "How long will I wait?"

We imagine what such a list looks like – a book with names in it, "new" names added to the last page, and appointments given to those from the first page. Simple and fair.

But is that really what we actually should ask for?

Let us pose a theoretical scenario; let's imagine you have a condition that, according to expert opinion, will not get worse for 6-12 months (dependent on some variable), then will get irreversibly worse by 10 percent per month for patients with some confounding factor, and after 15 months these people will never walk again. That changes your whole perspective on what a waiting list should be. For some people there is no point in a 20 month waiting time.

What this scenario points to is the role of dynamic wait lists. These are lists that every day are "re-ordered", based on predicted risk or health implications.

But is that queue jumping? No. Those in greatest urgency of need should always be prioritised and moved up the queue. Think of the triage desk at an emergency department – queue jumping (prioritising) is actually lifesaving.

And back to the original question: How long will I wait? The answer is so much more complex in this dynamic waiting list scenario.

Dynamic waiting lists are state-of-the-art, evidence-based systems and need expert management, good data, and predictive health models. This is not the book-and-pen type of system.

Organisational imperatives

Now, for the organisation's perspective on waiting lists. This gets tricky, as there are goals here that are not aligned with patients' or even society's goals.

How long will I wait? The answer to that question depends on how many are on the list, and how fast they are being removed, for a traditional book-and-pen list.

But, predicting how fast patients will be removed depends on many factors. Do we have staff and facilities to provide the care? Yes, today we have 10 dentists, but next month seven have left for private practice, so we have to halve the rate we take patients from the waiting list. All of a sudden, it is a new ball game for everyone on

the list, even those you have told how long it is going to be.

It is even worse in tiny disciplines where there are only one or two practitioners – if they leave and zero patients are taken off the list, that immediately means the waiting time just jumped to infinity.

And then there are the other drivers. CEOs might want more resources coming to their service – "I want to be "important and big".

Strategies for "managing" waiting lists

Below are some strategies from the waiting list clerk's playbook.

1. Create a "crisis"

A service can reduce the number of patients they take off each week so the list grows, and the funder can then be informed that a waiting list crisis exist, perhaps through the local newspaper or other public media. As this scenario unfolds, generating headlines that create heat for politicians, bureaucrats and administrators, more resources are usually forthcoming. But, was this strategy the best approach for patients? Or, was it the simplest quick fix to grow a service profile?

2. Whatever it takes to meet key performance indicators (KPIs)

An organisation's KPIs for a given year might include reducing waiting times. That's easy; just change the inclusion criteria, or make a new list (not a waiting list in the normal definition, just a list), but essentially this is a list to wait for the consultation to get onto the formal waiting list. All of a sudden, the additions to the formal list plummet. KPIs are met; resources flow in. But the "lower drawer of the filing cabinet" list for consultations grows topsy.

3. Encourage out-dated lists

Imagine your waiting list is three years. Many of the people on the list will have moved, found care elsewhere, or vanished. So without regular "cleaning" of the list, you have a list that looks long but, in reality, when you ask patients to come for care, the mail is "return-to-sender". This is especially useful if you are reporting the length of time the last person on the list has waited.

4. Divide and conquer

Waiting lists can be divided by localities, Clinic A, Clinic B etc. If you are looking to get resources to Clinic A (e.g. a nice new building or similar), dividing up the waiting list is an excellent strategy. The waiting list at Clinic A can grow to levels where complaints and public disclosures make it untenable to do nothing, while Clinics B, C and D continue as per normal or even reduce waiting times. Yes, de-centralisation/splitting is used regularly; another secret of the waiting list clerk.

5. Reporting statistics

Always worry if an organisation provides waiting list data for clinics, only if you "ring-up". A move to non-transparency is often a signal, as is the move to using "mean" as a reporting yardstick. Waiting lists are almost

never normally distributed, so “mean waiting time” is a skewed measure. In fact, with the commonest distribution of waiting lists, mean will always exaggerate the report. Tip to Minister’s office; if you are being given mean waiting times – investigate now!

How best to respond?

Now that we’ve had a look inside the waiting list clerk’s playbook, the question arises: what should we do with waiting lists?

First and foremost, waiting lists should not be the purview of a local health organisation.

Sure, they are the provider of care and the contributor of names to waiting lists, but the processing and management of waiting lists should be centralised to an independent body, not linked to providers or funders.

At a central waiting list organisation, the evidence-base can be applied and maybe, where applicable, dynamic waiting lists and such innovations can be implemented independent of the external pressures.

Similarly, central waiting list systems can ensure continuous waiting list management; for example, “cleaning” to remove people who have sought care elsewhere, and those who have left the jurisdiction etc.

They can do all this in an orderly and regular manner to maximise the quality of the waiting lists. And lastly, and most importantly, they can provide flexibility, offer patients on lists opportunities to travel to have speedier care elsewhere – to eliminate “divide and conquer” tactics.

Clearly, an independent central waiting list system can provide transparency and reporting at levels not possible across multiple providers and would be expected to be a system cost saving through scale. Each provider would not need resources for waiting list management.

Waiting lists are a fact of life in health systems; they are neither bad nor good but need clear, independent management, to be focused on the patients’ best interests.

The days of the waiting list clerks’ playbook needs to be brought to an end.

Time to catch up on oral health data systems and big-data analysis.

Date: February 15, 2017

Marc Tennant and Estie Kruger

Over the last 12-18 months a series of Scandinavian research papers has led big advances in dental public health knowledge. They include:

- a Swedish report published last month on the influence of social deprivation on dental caries in children and adolescents, as measured by an index for primary health care
- an investigation, also Swedish, of the survival of root-filled teeth in the adult population, and
- a register-based study in Denmark of variations of services received among dental care attenders.

What is the common link among these papers?

Their innovations and cost-savings are made possible by the use of massive, integrated data-stores from population-level systems of recording. These substantive, and in some cases whole-of-country data systems, are driving improvement in oral health of millions of people.

(As an aside to the principle focus of this story, the first Swedish study was of some 300,000 children and found that a primary health need index had a strong association with dental health, including giving stronger predictive tools for targeting services to those in need.)

Some 20 years ago our team, in the early development of the Oral Health Centre of Western Australia, identified the importance of this strategic direction for Australia. We began to advocate for and develop systems for large databases in dental public health. We designed and

implemented some of the nation’s first dental hospital-wide electronic patient management systems. We may not have been the first to use the software but the essence of the back-end analysis was a first, and was a critical seed that was watered by some, but disregarded by many others.

The basis of this development was to move to near-real-time data analysis (and big data approaches) that at the time had some huge gains in effectiveness and efficiency and that grew exponentially with time. As dental public health experts know, technology (in particular patient management systems) has enabled, for over 20 years now, mass data collection directly from the dental clinicians at chair-side and this data can be utilised easily for ongoing analysis.

Stuck in the days of mass ‘random’ survey data collection It is timely now, in the context of these recent international studies, to look back on those early efforts and reflect on why Australian dental health leadership was seemingly blind to the opportunity this offered. Why, in Australia, have State-funded oral health services been recording data on archaic paper-based systems (picture little index cards with pens and records stored in little cardboard boxes in caravans) until just a couple of years ago?

It helps to look at places like Denmark and Sweden where electronic data systems were taken up with

alacrity, as they are now reaping the rewards that near real-time massive data have brought. They will be advancing the health of their populations for decades to come. These countries also suffer issues of distance and accessibility (for somewhat different reasons from Australia), so geography can offer no excuse.

So how is it that Australia's dental public health has advanced so little since the mass "random" survey data collection days that were appropriate in the 1970s but continued for decades in Australia?

How has our leadership remained so narrowly focused on historical systems, and not advanced with the times? With data collection teams making robo-calls to fixed-line phones, other teams scanning coloured-in dots from bits of crumpled survey paper. Analytics limited to just a few.

As we have highlighted in previous calls for open access, Australia's most substantial oral health datasets are held by one team on behalf of the Australian Institute for Health and Welfare (AIHW).

These datasets include data from the Child Dental Health Surveys and the National Survey of Adult Oral Health as well as dental workforce data. As we noted:

Much of the substantial dental policy decisions made in Australia over the last two decades (eg dental workforce), as well as much discussion in the scientific literature and the wider professional press, has rested on these datasets, which have essentially only been open to a single analytical team.

And what is the result? We have a motley patchwork of electronic systems and paper recording, no discussion of integration of private practice data, no mention of any cohesive integrated data plan in our national oral health plan, and more specifically, at State levels (where there is the real imperative) no data plan either, other than.... yes, you guessed it – more surveys!

So while the genesis of innovative systems of data in dental public health started 20 years ago, its failure to take root has left Australia a dental public health global backwater while other nations can press their large integrated datasets into resolving grand health (and economic) problems of care delivery in dentistry with the click of a mouse, as the Swedish work on social deprivation demonstrates.

Risks of the status quo

Without such data sets, we end-up over-servicing some people and under-servicing others. Remember, today, dental disease is not a condition evenly distributed through the population, there are some who suffer greatly while others are okay. Services need to target those in need.

Let's also be clear: most of us reading this article are not the ones who are suffering. For the relatively wealthy, the risk is over-servicing, but that is a real risk too! No one wants extra fillings or crowns, or general anaesthetics that are not needed.

Secondly, if you think this problem of a lack of sensible, ethical, unified data is limited to dental then be clear it is not. Dental public health is a canary down the mine. If we compare our health data systems to places like the United Kingdom, Denmark, Sweden, and Norway, we look like something from the middle ages. Little seeds of greatness do exist – look no further than the linked data systems in Western Australia, which are world-class achievements but not nationally implemented.

We need now to play catch-up and fast! We need to integrate data systems and unite as a nation to get high quality extensive datasets to tease out the answers to the problems of the next two decades.

Acknowledgement

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Reforming higher education for dentists and oral health therapists to close-the-gap

Date: August 14, 2017

Cathryn Forsyth , Michelle Irving, John Gilroy, Stephanie Short and Marc Tennant

Indigenous Australians have higher rates of dental decay, gum disease and tooth loss than non-Indigenous

Australians, with most of these conditions going untreated, resulting in tooth loss. Dental disease can

significantly affect a person's quality of life, including their ability to eat, sleep, work and socialize. This means that the impact of the oral health gap is to increase the disadvantage already experienced by Indigenous Australians in many aspects of life.

As oral health researchers and educators, we believe that it is time to change focus in reducing the health disparities of Indigenous Australians. To achieve this aim, one of the key areas for action is to increase cultural safety of oral health services and the cultural competence of oral health care providers.

Cultural safety

Although Australia's National Oral Health Plan and several Closing-the-Gap initiatives identified Indigenous peoples as a priority, the prevalence of oral health conditions continue to have an impact, with Indigenous peoples reporting that health services are not culturally safe. The Australian Human Rights Commission reports that Indigenous Australians experience difficulties in accessing culturally appropriate dental care to improve their health and well-being.

One reason for this is that mainstream dental education has a strong emphasis on restorative and surgical care (fillings, root canal therapy, crowns & dentures) based on a Western bio-medical model.

Cultural competence has been recognised as a strategy to improve oral health outcomes for Indigenous populations for more than a decade. As accreditation standards for dental schools previously did not include Indigenous cultural curricula this shift in focus has taken time to filter through to Australian dental schools.

Cultural competence curriculum framework

In 2007 a team at the Centre for Rural and Remote Oral Health, now the IRCOHE.net at The University of Western Australia, developed the original Aboriginal and Torres Strait Islander cultural competence curriculum framework for dental students.

Following this initial development changes in accreditation standards by the Australian Dental Council require mandatory Indigenous cultural knowledges to be incorporated into all dentistry and oral health programs within Australia. Consequently, cultural competence is gaining momentum, prompting further investigation into Indigenous cultural competence curricula development.

A lack of progress

Acknowledging the lack of progress in cultural competence development in dental services, A team of dental therapists, dentists and social scientists from the Universities of Sydney and Western Australia conducted a systematic review of Indigenous cultural competence in dentistry and oral health higher education. This review

identifies specific content and strategies to incorporate Indigenous cultural competence into curricula:

Provide students with the opportunity to reflect on their own stereotypes and biases to address individual and institutional racism

Deliver an accurate historical understanding of the effects of colonisation on Indigenous Australians

Instill knowledge of health disparities, community health and the social determinants of health using a combination of face-to-face and online teaching strategies

Enable students to engage with Indigenous communities and complete reflective writing tasks based on their experiences with Indigenous communities during their course

Working with communities

The Faculty of Dentistry at University of Sydney is working with Aboriginal Community Controlled Organisations to provide student community placements in various Local Health Districts and other institutions around NSW to enhance student knowledge, skills, and understanding of Indigenous culture before they graduate.

One particular placement involves dental students working with the team at the Poche Centre for Indigenous Health to increase oral hygiene within schools and promote drinking water from the newly installed chilled filtered water systems, as healthy alternatives to high sugar beverages, within the Central Tablelands communities.

Additionally the Faculty of Dentistry at the University of Sydney has implemented various Indigenous student recruitment and retention strategies over the past few years to support several Indigenous students in the Bachelor of Oral Health & Doctor of Dental Medicine programs.

Strategies include: identifying appropriate university preparation courses; providing one-on-one support through the application process; development of an Aboriginal student support network; and access to academic tutoring and scholarship funding. Peak bodies in dental education could implement and promote these across the nation.

Finally, a review of Indigenous cultural competence curricula in the Bachelor of Oral Health & Doctor of Dental Medicine programs at the University of Sydney has been undertaken. This will provide insights into the barriers and enablers to incorporating Indigenous curricula into dental education. Reforms of this nature will facilitate attitudinal changes for future generations of dentistry and oral health practitioners to redress oral health inequalities experienced by Indigenous Australians.

Health and Money: A sick system for sick people?

Date: February 06, 2018

Marc Tennant, Laurie Walsh, Estie Kruger, Andrew Brosteck

While everyone needs an income to live, income is not directly linked to factors that are important to sustaining a strong and healthy society. Modern Western societies have become progressively more money-focused, which can lead to the idea that the higher the income received, the more “important”, or contributory, is the person to society. Obviously this is not true. Every week, those who come and remove the rubbish bins from our homes are critical linchpins in keeping us healthy, as are maintenance workers who keep modern infrastructure such as transport systems and utilities working. Those who work to maintain water and sanitation systems, including sewerage systems, are instrumental in maintaining public health and increasing life expectancy.

Activity-based models

At the same time we expect that our health systems should not only improve the health of the population, but also be financially sustainable to society. We the taxpayers, contribute a great deal of funds towards these systems – in Australia, around 10% of GDP (\$175 billion per year). Much of this funding is distributed to health care professionals through various payment systems. In general practice medicine and dentistry, billions of dollars are distributed through fee-for-service models that are based on item numbers.

Each of these items represents a procedure or intervention, in other words, an input or form of activity, rather than a distinct health output. Hence the question in the private sector, do the activity-based models that now dominate Australian health care provide the best health outcomes?

Of course what activity does link to, is payment directly to those providing the services. Certainly in the private sector, whether that payment comes from personal disposable income, or partly from the taxpayer, the end result is the same, namely that health care professionals are paid based on their activity, with item numbers being the gears that link the system back to the individual practitioner.

Perverse incentives for providers

Practitioners in private practice are running small businesses, so they have to sustain those businesses, taking into account the costs of practice, and how these affect the personal income received. Achieving a profit is the economic reality of operating a small business. Therein comes the dilemma. The health maxim is to do “as little as possible and as much as necessary” to ensure that the health of the patient is improved, however on the

small business side the natural emphasis is to maximise profit.

For example, does the practice “up-schedule” (use more complex codes that produce more income), or maximise the total number of items of care provided, to achieve the greatest gap between cost-of-provision and profit? Practitioners do make these sorts of decisions, as has been seen in the different baskets of items provided for patients under different funding conditions. In dentistry, some significant examples have been discussed in previous ‘TalkingTeeth’ articles. There are parallel examples in medicine and other disciplines.

What the discussion misses to this point, is what the patient actually needs, or wants. Surely, that should be the starting point, rather than a post-script!

The distorting effect of fee-for-service

The concern here is that using a simple fee-for-service reimbursement model can lead to warping, where the true needs of a patient for maximising health, are distorted by a desire to maximize wealth by overtreatment. A buffer to the profit motive exists in some places where the government intervenes to alter the dollar value of services in order to incentivise some treatments and discourage others.

But is this the best way, or indeed the only way? There certainly are health systems where item codes for medical and dental treatments do not exist, or are not used as the gears that drive the system. One interesting approach that departs from the focus on “item number production” is capitation. Here a practitioner is paid a fixed monthly or yearly amount to keep a person healthy. Such models have been used in Australia and overseas, and are being used in pilot schemes in the British NHS.

Alternative models

However, these approaches can become distorted as well. Practitioners could scramble to have only healthy people in their care, so they are paid to do little. Alternatively, practitioners may look to refer or “move-on” patients in their pool who are not doing so well, to attenuate the costs of having to look after those with greater needs, as a form of supervised neglect. There could also be attempts to limit accessibility of certain patients to care, whilst still taking the regular capitation payment. Capitation systems can work, but these issues all need to be recognised and addressed.

An alternative approach takes away the small business drivers by having clinicians on a salary. In Scandinavia, this approach has been highly effective in re-focusing

clinicians onto providing evidence-based care, and adapting rapidly to new models of care, with an emphasis on prevention and health promotion. The focus is now clearly on the patient and their needs, rather than on the practitioner and their income.

The altruistic emphasis on the betterment of society as a whole and promoting social justice and societal good are powerful benefits of this approach. Salaried clinicians in the defence forces and in the public sector in Australia are contemporary local examples, albeit as a minority of the Australian health system.

The case for increased monitoring

So, if one assumes a lack of will to move strongly to capitation or salaried clinicians as *carte blanche* approaches, what can be done to make the best from an activity-based system that is focussed on item numbers? The answer is better systems for post-provision monitoring of service patterns. Profiling item number usage is not something new, of course, since DVA and private health insurers have been doing this (albeit with different levels of sophistication) for quite some time.

What is needed, in our view, is a system that operates in real time with analysis by state of the art artificial intelligence based algorithms, to better monitor the health system performance as a whole. What we are suggesting is a system that brings together and holds all health item number data, with associated integrated real-time monitoring systems. The feedback from such a centralised system would empower several activities – the review of patterns of service by practitioners and their peers, as well as third-party providers (including government).

The system would need to develop a high level of sophistication to cover the many recognised specialties within clinical practice, but this could be developed over time, once general practice medicine and dentistry were included as a starting point.

Using health item number data to drive change

If it were mandatory for the data to flow (in a secure and private way) to a centralised independent analysis, then there would be a powerful way to identify changes in the pattern of care and the mix of services being provided to patients. Such information could inform the emergence of appropriate enhanced funding models for care for socially deprived groups in the community, ensuring that taxpayer funds provided were being used in the right way and in the right place.

Likewise, at an all-of-system level, one could quickly see the effect of changes in federal government policy on the provision of services. The monitoring function should enable greater traction for the development of schemes to fund care for patients with disabilities other special needs, which would align with the principles behind the NDIS.

At the moment, our data systems for item numbers are limited and fragmented. Good data can protect us the economic winds that blow across health care, and help keep us safe and well, while limited fragmented unconnected data will not.

This is not a new idea. Many countries that have effective (and efficient) health systems have been doing this for decades. Organised data in places like Sweden and Norway is saving their health systems billions of dollars a year, and at the same time saving people in the community from inappropriate or unnecessary care.

Diagnosis versus care: What do we need to know to advance health systems of today and the future?

Date: February 26, 2018

Heiko Spallek Marc Tennant and Estie Kruger

In our last article we talked of the complex nature of measuring outcomes of healthcare, based on care provided. Procedure-driven “accounting” has the tendency to distort the care provided, as it is the primary funding mechanism of remuneration to healthcare professionals, including dentists. Today, we want to explore the “health care event” with the lens focused on diagnosis—observing the process from the “other end”.

At the population level, diagnosis provides a status update that describes the health of a nation and permits estimates that predict the necessary provision of care. In Australia and many other countries in the world,

Diagnostic Related Groups (DRG’s), reflect this relationship in hospital care.

DRGs for dentistry?

However, ambulatory care settings, including dentistry, have not yet adopted this approach. Drivers for dentistry, by contrast, focus on service provision, resulting in ever expanding care delivery that favours more over better. Researchers and public health policy makers are affected by this procedure-oriented accounting that results in datasets on the care provided through item numbers (but hidden – do see our previous #TalkingTeeth on open data).

Australian dentistry, like most other dental care delivery systems, does not have officially sanctioned diagnostic codes, resulting in barriers to record and monitor diagnoses and subsequently analyse treatment outcomes, much like hospitals do.

Triggered by the desire to improve dental care outcomes and improve patient safety, work has advanced in the area of recording diagnosis in a logical and structured manner, see relevant research here and here. However, these innovations have been predominately in the United States and have not made their way across the Pacific to Australia.

There are standardised diagnostic dental terminologies available; in fact the SNO-DDS terminology is an American National Standards Institute (ANSI) approved standard, now in use in several countries, and supported by the American Dental Association. SNO-DDS is a collection of specific dental terms that is designed for the purposes of dental diagnosis documentation. It consists of about 1700 terms organised into 106 subcategories and 17 major headings.

If we want to track the health status of the population, we need standardised diagnostic terms applied to all conditions. Drawing conclusions from procedures performed is misleading, as we would not know if a filling was placed due to a lost filling, or a primary caries, or secondary caries, or a fractured filling.

The impact of computerisation

After transforming many parts of life, computerisation is also starting to transform health care delivery, also called the Second Machine Age. However, unlike humans, machine-learning algorithms require vast quantities of data to support clinicians in their work. While we disagree with proponents of the complete displacement of professionals from the care delivery process we must acknowledge that dentistry has already greatly benefitted from computerisation (e.g. sequential aligners and milled restorations), and is likely to benefit more from the adoption of technology (e.g. improved delivery of tobacco interventions).

However, all Computerised Clinical Decision Support Systems require detailed standardised, machine-readable inputs. Thus, the adoption of standardised diagnostic terminologies is on the crucial path to improved care. In dentistry, as advocated by Kalenderian et al we need to move to a diagnostic-driven profession to reap the benefits that medicine has derived from structured diagnostic documentation: improved quality of care and

improved communication with patients, and between providers.

Population health benefits

At the population level, diagnostic data will assist government s, and more specifically the community, in identifying and monitoring high need or high risk groups, and establish a strong, near-real-time, disease surveillance system so as to assess trends in the nation's health. And for researchers and policy makers it allows comparisons to be drawn across cultures/countries and focus efforts to the most effective, best practice innovations, to reduce the burden of disease to society.

The adoption of standardised diagnostic terminologies will also enable dentistry to collect data that will be the foundation of a Learning Health System (LHS). The LHS continuously, economically and routinely analyse all data, not just from electronic health record systems, but includes patient-generated health data, wellbeing data, environmental data and other social determinants of health.

When this all becomes part of the culture, cycles of learning that result in improvement can happen on an ongoing basis. Subsequently, patients and healthcare providers at all levels access the “learned” knowledge to proactively monitor and improve health anywhere, any time, and with any device on any platform.

Patient management systems must become learning systems

Patient management systems, that are now near universally used in the public sector, can play a critical role for these services in delivering their mission if they embrace the core principles of the Learning Health System: routine capture of all patient data, transformation of information into knowledge and its dissemination, and economical and continuous improvement as part of the culture.

Health systems, at any level of scale, become learning systems when they can continuously and routinely, study and improve themselves using data that are valid, up-to-date and easily accessible in a Health Information Technology Ecosystem.

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When one in a million is healthy odds

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Humans are not good at calculating the probability of events of ultra-low prevalence. It is not something we face regularly, and thus is not something we have practiced. For example, what is the probability of being killed by lightning? What is the chance of a coconut falling from a tree and killing someone? These are not things we think about so often.

But, in modern times with massive improvements in health, we are down to these sorts of probabilistic levels of calculation for many conditions that can have substantial public impact. Today, humans are required to make these sorts of calculations as they go about their daily lives, to weigh up their personal odds.

For example, is it safer for me to drive to work or to catch the train? What is the risk of me dying of polio? What is the risk of a severe consequence from vaccinating my kids? What are the chances of me winning the lotto tonight? These are all significant daily scenarios we face with ultra-low probabilities. Every action we contemplate is guided by a risk-benefit calculation, and the level of “comfort” we are willing to accept varies greatly between individuals and situations.

Let’s take the scenario of speeding to the airport, for example. Many worry greatly of the possibility that a flight they are on may crash, when in reality, the risk of aviation accidents in modern air travel is measured in the order of tens of millions. Contrast this with the probability of a speed-related traffic accident — one in 200,000 (depending on how you calculate it) — which is many, many times higher. Yet the vast majority of people tend to underestimate the latter and overestimate the former.

More specifically, in health, we have seen some conditions plummet in terms of both morbidity and mortality. Prostate cancer is one complex example. In the USA, this is the most common malignancy in males (after skin cancer), with more and 150,000 diagnoses annually. However, 92% of cases are localised and have a death rate of 0% at 5 years and just 2% at 10 years. In gross terms, then, males in the USA have a 1/1000 chance each year of being diagnosed with prostate cancer, and for every 100 such cases, 98 will live beyond a decade. We are now getting to ultra-low probabilities that are hard to fathom.

Another such condition that strikes fear into the heart of any parent is childhood leukaemia. During the 1980s this was the most fatal cancer in children under the age of 15 years in the United States, but a look beyond the headlines tells us more. Around 4 in 100,000 kids will be diagnosed with leukaemia (compared with 20 in 100,000

for all cancers in children), but thanks to modern care 3 out of these 4 will survive, even thrive. In real terms, the risk of dying in childhood from leukaemia is now at the same level as being attacked by a shark while surfing in Australia, and is trending lower still.

Such ultra-low probabilities can prove difficult to comprehend and weigh in decision-making.

When the odds are forensic

What can we do to help us better understand and contrast such long-shot scenarios? At low probability (measured in the thousands), diagrammatic representations are commonly used to convey risk to patients. But as we move to ultra-low risk we need other ways of communicating these levels of chance, and of gauging a “comfort” threshold for risk-benefit calculations.

This year our team looked at the problem of forensic dental identification, and the issue of ultra-low risk probabilities came to the fore. We asked people to consider the following question:

“If you have a piece of a jaw as the only part of your daughter’s/son’s mortal remains, what odds would your family expect that this was (or was not) your loved one?”

It was interesting to hear people’s views. But, what is the answer? Probabilities of 1 in 10, or 1 in 100 were considered crazy and dismissed out of hand. At 1 in 1,000 some were happy, but many were not, and — interestingly — many people remained unhappy at 1 in 10,000. What people accept as a reasonable level of ultra-low probability in such a scenario differs vastly, and are likely to be influenced by both social and cultural norms as well as the specifics of the question.

As health practitioners, it is vital that we appreciate how patients view such ultra-low probabilistic events and develop tools to help them understand the relative risks and consequences. This issue will only become more prominent as we progress to more effective systems of prevention and treatment.

