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Projections

Mobile Population Based Care Solutions from Canada and Finland

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ABSTRACT

This paper investigates creative, mobile population-based medical solutions with integrated care delivery strategies in two different contexts. British Columbia's two-truck mobile medical unit operates in both remote and highly urban environments in Canada, serving at-risk Canadian populations in areas ranging from remote First Nations communities to downtown Vancouver homeless people suffering from overdoses in the deadly Fentanyl crisis. The highly adaptable unit can mobilize at a day's notice and can travel by road or by ferry. The other investigated mobile care solution is located in depopulating South Karelia in Finland, where a highly customized social and healthcare service for seniors has been created as part of the EKSOTE initiative. (EKSOTE stands for Etelä-Karjalan sosiaali- ja terveystieteiden - the South Karelia social and health district). The service provides public health services, urgent primary care, mental health services, chronic disease management, psychosocial rehabilitation, life skills training and assessment as well as home health support for seniors, populations at risk and clients in remote communities. Based on interviews with experts (clinical planners, public health managers) and an exploration of statistics and policy documents, we argue that both examples demonstrate different but exceptionally versatile mobile services with integrated care strategies provided by staff with broad-based competencies. Importantly, these units cover services that have been identified as significant gaps in care in rural or hard-to-reach populations that otherwise would remain untreated. Moreover, as accelerating urbanization is resulting in the depopulation of other areas, mobile services are a viable option in areas experiencing migration losses that no longer can support regular clinics. Income polarization and de-industrialization have increased homelessness, disenfranchisement, addictions and misery in urban areas. The approach of mobile services is by definition patient-centered care as the service is physically brought to the service user, and not the service user to the practitioner. The multi-disciplinary care offered automatically shifts towards a holistic direction as opposed to 'pay for service' systems where users can be limited on how many issues can be discussed during one consultation. Case management improves as different members of the care teams may all see the user on the same visit. We conclude that as a planning opportunity, by providing platforms and service networks that tie into existing (even diminishing) infrastructures, mobile, integrated care services provide important surge capacity and opportunities for highly customized services for clinics tailored to complex events and populations (refugees, outbreaks, events). Like humanitarian relief organizations such as [Médecins Sans Frontières](#) (MSF), local mobile health services are also relevant in response to emergencies, natural disasters and adverse weather events.

Introduction: Providing health care in difficult locations

De-industrialization, gentrification and income polarization have increased homelessness, disenfranchisement, addictions and misery in many urban areas. Simultaneously accelerating

urbanization is resulting in the depopulation of other areas, causing the loss of services and community. These patterns pose problems for the provision of health services in many ways. In urban areas there is a special need to extend care to marginalized and at-risk populations, a demographic where it is also particularly difficult to track patients and obtain reliable data on care outcomes. Rural and remote areas experiencing population losses on the other hand can no longer support regular clinics, which is a threat to elderly people who are unable to move closer to services. In many cases this same client group also experiences reduced mobility and may no longer have the confidence, life skills or license to drive, or a support person to take them to appointments.

In this paper, we introduce mobile health services as a means of providing services in “difficult locations” in two very different contexts. By mobile health services we mean in-person, face-to-face services provided by medical staff that are physically brought to the end user, rather than the end user needing to travel or commute to access a service. ‘Mobile services’ is sometimes also used as a term for telehealth or healthcare provided remotely via internet or mobile phone applications. This type of remote connection service can often supplement the physically mobile services discussed in this article. Mobile healthcare services have historically been most common in military and temporary contexts. Field hospitals were struck up on short notice near battlefields in cities, homes, agricultural buildings, places of worship, or the open air. Typical to most applications were the fast set up, ability to relocate and focus on trauma, emergency medicine or outbreaks. More traditionally, the classic practice of a family doctor making house calls can also be seen as a mobile service.



The BC Mobile Medical Unit driving onto a ferry. Image: Provincial Health Services Authority

Today, mobile medical units can offer services in a vast array of disciplines including emergency medicine, primary care, community health, minor surgery, perinatal, social care, laboratory medicine, oral health, mental health and addictions services, public health and immunizations, rehabilitation medicine, home health and medical training - to name a few. Realistically, only services requiring highly complex teams, large and sensitive equipment and exceptionally controlled environments are unsuitable for mobile applications. Significant need of aftercare or specialist follow-up may also rule out some mobile services. Mobile medical services can be offered at community centers, fairs, sporting events, schools, churches or other assembly facilities in remote communities for example. They can also be offered to supplement a local small clinic. Mostly, the mobile van or truck gets parked on location and services are offered inside the vehicle. Telehealth capacity is an essential part of mobile healthcare services as remote connectivity and ability to consult directly with specialists and acute care centers helps reduce secondary referrals, travel, patient transport and service cost. The healthcare user also receives care faster which improves both care outcomes and patient experience.

Mobile healthcare can reduce the cost of providing healthcare per visit, but on the other hand may not achieve the same amount of efficiency and volume as regular clinics due to travel times and sparser

populations in areas of visits.

In this paper we juxtapose two cases of mobile care both in a first world context. Vancouver, Canada and South Karelia, Finland offer an interesting comparison of systems where difficulties of providing care are presented by very different conditions: in Vancouver by addictions and in South Karelia by aging and frailty. Both Finland and Canada are located next to major world powers (the United States and Russia) and have strong national identities, and healthcare systems. While Canada is seven times larger than Finland by population, it has slightly fewer physicians per capita (2.1 per 1000 people compared to 2.7 per 1000 in Finland). Both countries have a 'two tier' universal health care system where clients can opt to use private providers, at their own cost, for reasons ranging from access, type of procedure (possibly excluded from public funding), speed or quality. Over 90% of physicians in Finland work for the public sector on a monthly salary. In Canada physicians are private entrepreneurs who invoice the public system on a fee per service basis – a more expensive model. According to WHO Global Health Observatory data repository, Finland spends 9,2% of its GDP on healthcare and Canada spends 10.6% (WHO statistics, 2017)

In terms of demographics the countries differ greatly as Finland is almost completely composed of Finns (95,3%). Canada, on the other hand, is a truly multicultural society with over 50% of the population representing other ethnicities than Canadian. Life expectancy at birth in Finland is 79 years for males and 84 years for females, and in Canada 81 years for males and 85 years for females. The life expectancy in both countries is approximately 10 years higher than the global average of 72 years (WHO, 2016 and 2017 numbers). Finland's population is slightly older with a median age of 42 (Canada's median age is 40).

The western Canadian province of British Columbia and Finland are of similar size (5.0 M and 5.5 M inhabitants respectively, 2018 figures). As a result of democratic culture and a tradition of public care provision, in both countries access to quality healthcare is considered a right, not a privilege. In Canada we look at the city of Vancouver and in particular the Downtown Eastside neighborhood with a population estimated at under 8,000 with a higher than average proportion of males and persons living alone. Vancouver is a port city of under 700,000 inhabitants and a gateway to Asia from the Pacific Northwest. While a certain amount of drug and substance use has always been part of its urban makeup, in recent years things have shifted catastrophically. Vancouver's Downtown Eastside is known for being 'the poorest postal code in Canada'. Today however it is also subjected to heavy gentrification pressure. The protection of low-income housing in the area has prevented displacement to some extent, yet Burnett (2017) and Smith (2016) argue that the strong stigmatization of the area as a place of drug use and high rates of health-challenges related to poverty and social exclusion, such as HIV/AIDS, have become catalysts for gentrification in the neighborhood. The commodification of drug

use and street crime in the area are considered important elements of the diverse character of the neighborhood, and consequently appeal to privileged urban dwellers.

Finland, on the other hand, is experiencing a second wave of urbanization. This is causing heavy depopulation in many areas outside the main urban centers. South Karelia, where our case study is situated, is rapidly depopulating and is left with mainly an aging population (Maakunnittaiset ennusteet 2019). In the policy debate, this is associated with high cost to society as the needs of the aging population in sparsely populated areas are expensive to provide for. To emphasize the economic challenge that follows, aging areas are referred to as places hit by “age quakes” or “grey tsunamis” (Hörnström & Roto 2013). The aging population is assumed to increase the demand for health services, while the tax base is simultaneously diminishing because of migration and declining birth rates. At the same time, it has become all the more difficult to find health professionals willing to work in remote areas. While both Finland and Canada experience similar issues with aging populations with longer lifespans with multiple co-morbidities, the population base amongst the elderly in Finland is very homogenous, and public records and national health databases are exceptionally comprehensive which is helpful when it comes to projecting and planning for the demand for healthcare services.

In this paper we seek to understand what kind of services can successfully be provided in a mobile way in the two different contexts. We ask: Do mobile health services work as a means to serve people who are difficult to provide for either because of social exclusion or remote location? Spatial justice and injustice are outcomes of decisions about the allocation and emplacement of resources such as jobs or health care services (Marcuse 2009). Soja (2010, 47) mobilizes the example of the difficulty of equitably distributing health services – shaped not only by the location of providers and consumers but also by differences in wealth, social and political power, and racial bigotry – to help make his case for spatial justice. Both our case studies deal with groups that, both because of their location and vulnerability, are at risk of being subjected to poor access to health care services. Therefore we also ask: What is the role of mobile health service in preserving spatial justice when it comes to the provision of health services? We draw on structured interviews with two public health executives and an operations director as well as reports and statistics to argue that mobile services with integrated care strategies provided by staff with broad based competencies vastly improve care satisfaction, care outcomes and also reduce overall healthcare cost. Importantly, these units also cover services that have been identified as significant gaps in care in rural or hard-to-reach populations that otherwise would remain untreated.

Case 1: British Columbia Mobile Medical Unit

The British Columbia Mobile Medical Unit (MMU) originates from the Vancouver 2010 winter Olympic Games. The resort municipality of Whistler, which hosted all the alpine and Nordic events, does not have an acute care hospital. The International Olympic Committee requirements however mandate a

high standard of medical facilities and the Vancouver Olympic organizers provided these by a highly equipped and versatile two truck mobile unit. After the Olympic Games the Mobile Medical Unit was purchased by the British Columbia provincial government to strengthen its ability to provide medical services throughout the province which includes several remote and hard to serve communities. The unit is also part of BC's provincial emergency preparedness plan.

The MMU consists of two trailers, one is the patient area and treatment trailer that expands to 1000 sf and can be set up for 4-10 stretchers depending on acuity. The other trailer houses all the support technology as well as medical supplies. There is also a service van that travels with the Unit. The MMU can deploy on 24 hours' notice and is most frequently used for clinical education, hospital renovation support and community outreach clinics.

In April 2016 BC's provincial health officer Dr. Perry Kendall declared a public health emergency in response to the rise in drug overdoses and deaths, driven by the increased presence of fentanyl that has permeated the drug supply. Fentanyl is a synthetic opioid, estimated at 75-100 times stronger than morphine, that has caused an unprecedented number of accidental overdose deaths (Center for Addictions and Mental Health 2017). The declaration allowed medical health officers throughout the province to collect more real-time information on overdoses in order to identify immediately where risks were arising and take proactive action to warn and protect people who use drugs. "Health authorities have consistently asked for more data that will help inform responses and prevent future overdoses," said Dr. Kendall when declaring the emergency. (Province of British Columbia, 2016). While the monthly deaths had climbed to 76 in the month of January 2016, the statistics did not include overdoses that were not fatal. The health authorities needed more accurate and detailed information of the problem in order to tailor their local responses. During the health emergency more detailed tracking was immediately put into place, and authorities soon knew where batches of bad drugs were used and where the intensity of cases was highest. A health emergency also allowed local health authorities to request additional funding for their operations that were being drained by the growth of cases.

During the decade of 2001-2010, the annual number of fatal overdoses in British Columbia averaged 204. In 2014 it had risen to 368, in 2015 it was 530, in 2016 it rose to 993 and in 2017 it was 1493. The latest available statistic, year 2018, shows 1535 overdose fatalities and while it is the highest number ever, it is also the first one that suggests any slowing down of the trend of acceleration.

Illicit drug overdose deaths in British Columbia number more than all deaths from accidents, suicides and homicides combined, and in 2018 also contributed for the first time to the lowering of the province's overall life expectancy. Fentanyl was detected in 87% of fatal overdoses in 2018 (British Columbia Coroner's Service). Statistically these numbers translate to over four fatalities every day, a

frequency so devastating that it leaves very few people completely outside of the influence of this tragedy.

The Province of British Columbia, coordinated by BC Center for Disease Control, has launched a concerted effort to combat the opioid crisis based on harm reduction. The British Columbia Harm Reduction Strategies and Services (HRSS) Committee provides the structure to facilitate coordination between the Ministry of Health, Provincial Health Services Authority, the First Nations Health Authority and the five regional health authorities, and other key stakeholders in work related to harm reduction in BC. The measures are comprehensive and include de-stigmatization of drug use, public awareness campaigns, suggestions for safe drug use, training of professionals, community and peer group support and close collaboration with municipalities, first responders and law enforcement. Drug use is treated as a health care issue, not a criminal justice matter. Vancouver British Columbia was the first community in North America to establish a safe injection site in 2003, partially motivated by the large local HIV epidemic of the 1990's. Currently there are six safe injection sites in the greater Vancouver area. In addition, several broad, publicly available and completely free harm reduction initiatives are in operation ranging from outreach and education, peer support, needle exchange programs, naloxone kit distribution as well as substitution therapies (BC Center for Disease Control 2017). To acknowledge the extended effects of the crises, the BC Center of Substance Use has created a Grief Handbook and the provincial government also supports a primarily volunteer run BC Bereavement Helpline.

As part of its large harm reduction initiatives in late 2016, Vancouver Coastal Health Authority requested the Mobile Medical Unit to be deployed to the city's Downtown Eastside area to respond to the Fentanyl crisis. The unit was stationed in an inner city parking lot from December 2016 to May 2017, its single longest deployment to date. The choice to use the Mobile Medical Unit in the addiction crisis served two purposes: first and foremost to reduce overdose deaths in the Downtown Eastside area and secondly to relieve congestion at the inner city St. Paul's Hospital Emergency room which was being significantly overburdened by addiction emergencies. The paramedics were responding to up to 30 overdoses a day, of which approximately 15 would require transport to the Emergency room. During this time, the ambulance service was almost unable to respond to any other type of emergency calls. (Hennecke, 2019).

The MMU was offering opioid crisis emergency response as well as social services outreach care such as counselling and support for family members of people with addictions. During the almost seven month deployment the unit had 3,064 patient visits, of which 1,334 were directly addictions related: providing methadone and suboxone prescriptions, naloxone kit training, and community outreach support. According to Peter Hennecke, the Clinical Operations Director at the British Columbia Mobile Medical Unit, over 500 of these visits were active overdoses. While the unit provided significant relief

to the Emergency rooms, exclusion criteria still directed the most unstable cases as well as intoxicated clients directly to the hospital. (Hennecke, 2019).

Detailed statistics (Scheuermeyer et al. 2019) over four months of care (December 2016 – March 2017) showed 269 opioid overdoses at the MMU, representing an average reduction of 4 patients at the Emergency Department each day. The time gains realized for the ambulance service were also significant: they had a very quick drop-off at the MMU as opposed to the approximately 30 minute booking time of each patient at Emergency.



The BC Mobile Medical Unit on location in downtown Vancouver, 2017. Image: Provincial Health Services Authority

All standard medical procedures were provided at the MMU but the patients were also given warm blankets, food and juice immediately upon arrival. The small size of the unit and the single purpose focus activated clients in their own care to take more responsibility of their health. (Hennecke, 2019).

However it was not only overdose clients who were brought to the unit for care: the accessibility of the location also attracted walk-ins directly from the community, and over half of the people who visited were seeking opiate replacement therapy and counselling support including methadone or suboxone (drugs that treat opioid addiction), a naloxone kit or were simply requesting a meeting with an

outreach worker. Far more patients received medications for opioid use treatment in the MMU – about one in five compared to one in fifty in the ED (Mobile Medical Unit, 2018).

It is self-evident that this amount of therapy, counselling and outreach could not have been achieved without the mobile unit.

The Mobile Medical Unit was staffed by the local health authority's emergency room nurses, addictions physicians and outreach workers. Initially the unit was staffed from 9 a.m. to 3 p.m. seven days a week, but the hours quickly got modified to 9 a.m. to 9 p.m. daily to best meet the needs of the community. The addiction crisis deployment was the Mobile Medical Unit's most high profile deployment so far. While opioid related fatalities still continue in British Columbia, the Mobile Medical Unit was a significant factor in bringing access to care and also relief to many people secondarily affected with the crisis such as spouses, family members and peers who could go to the unit to accompany the client and also receive food and attention. (Hennecke, 2019). The deployment ended in May 2017 when additional permanent addictions treatment facilities were completed in a downtown street front location in Vancouver. The speed with which the Mobile Unit was able to be deployed was critical in its effectiveness.

What happened to the opioid crisis in the longer run? While the growth of fatalities is slowing down, the problem is far from resolved. At the end of year 2019, the public health emergency is still in place in British Columbia. Dr. Kendall retired in 2018, and when leaving office he noted that the overdose prevention sites and naloxone kits were having an impact in reducing overdose deaths. However, he expressed regret about the timing of the declaration of the health emergency: "In hindsight, if I was to do it again, I would (have done) it a year earlier. The reason I didn't declare the emergency in 2015 is that we hadn't yet seen that horrendous kick-up that came with the arrival of carfentanil. I worried that by declaring it early while it was less of an emergency, it would not get the kind of attention and resources to it. I think had we been able to roll out responses like overdose prevention sites a year earlier, we would have saved more lives and we would have more resources in place than we currently do," (Vancouver Sun, 28 January 2018). The WHO guidelines on public health emergencies strongly emphasize the role of timely communication: "During public health emergencies, people need to know what health risks they face and what actions they can take to protect their lives and health. Accurate information provided early, and in languages and channels that people understand, trust and use, enables them to make choices and take actions to protect themselves, their families and communities from the health hazards threatening their lives and well-being." (World Health Organization, 2018).

The BC Mobile Medical Unit has been well received, and since 2010 its services have been used all over British Columbia. The uses have ranged from education and staff training, medical conferences, providing a temporary space to a hospital undergoing renovations, running community clinics and medical support for other sporting and mass events than the Olympics. When discussing the relative

merits and adaptabilities of the unit to different uses, a prevalent comment is the size of the unit. (Hennecke, 2019). At two trucks and a support vehicle, the unit is large and heavy to move. As an acute care-capable facility, the BC Mobile Medical Unit comes at a size that requires a team of people to mobilize it. The service is well established but the utilization rate of the MMU remains at approximately 25-30%, and the DTES deployment notwithstanding it is mostly used for non-acute care. If British Columbia were to develop its mobile medical fleet further, additional vehicles could be smaller to provide more easily operating services that could serve the needs of community clinics better. Nevertheless, as the Vancouver case has shown, mobile health care services can be used to reach vulnerable individuals in cities, and further that these individuals can be served effectively and equitably regardless of their spatial location in the city center. However, in the next section we turn our attention to a very different context, namely a sparsely populated remote rural area, where in particular elderly people are at risk of being displaced from their right to health care.

Case Study 2 – South Karelia, Finland: Enablers for success

The South Karelia Social and Healthcare District (EKSOTE) was formed in Finland in 2008 as a consolidated health authority. It provides health and social services to nine municipalities with a total population of about 130,000 in southeastern Finland. From the outset, EKSOTE's objective was to consolidate its services in order to achieve savings in operating costs, in particular through reduction of inpatient hospital stays, low acuity emergency visits and unnecessary ambulance calls. Particular challenges were presented by the rapidly aging population and the large geographical catchment area.

Pentti Itkonen, CEO of EKSOTE, notes that traditionally, efforts in this field would center around integrating acute care hospitals, primary care settings and social services to reach better coordination. Political decision-making would be used to ensure that strategic management, financing, information technology and real estate investments as well as staff recruitment would create a platform of common use and shared resources. However, EKSOTE realized that they could not respond to the demographic challenge by simply adding more human resources and building new hospitals and assisted living facilities. The key was to support home care in such a way that only those patients who really benefited from hospital care, would go to the hospital. A significant number of hospital visits were due to unbalanced medication or medication errors, lack of rehabilitation, poor nutrition, or feeling unsafe or lonely. A broad common denominator was frailty. According to Mr. Itkonen, from an economic point of view the largest cost savings could be realized by simply having fewer patients in the hospitals.

In Itkonen's view today's social- and healthcare service delivery is focused on costs and less on social and health outcomes and wellbeing, quality of life and values. Social- and healthcare systems reward providers who see higher volumes of clients and bill for more services, instead of those providers who

deliver the most value and wellbeing. EKSOTE planners wanted to challenge the status quo from both the cost and outcome perspective.

To obtain new quantitative outcome data, Finland's comprehensive electronic patient records systems and highly technology-friendly society offered a good foundation for use of artificial intelligence in reviewing care outcomes in a new way. For example, it was possible to mine how many patients or customers came back after receiving a service or treatment and then used some other services. This easily detected which patient or client groups were the most expensive. It also became clear that some clients did not receive the optimal combination of services. To address this issue, EKSOTE started to plan mobile services (Itkonen, 2019). In comparison, British Columbia is still in the process of moving into a centralized electronic patient record system. The process is slowed down by high cost, several existing booking and record programs that are incompatible between each other, as well as confidentiality concerns regarding privacy of patient information. The status quo still has patient information in paper charts even at some large hospitals.

The EKSOTE team's first mobile unit is called Mallu and it was launched in 2010. Mallu is a van that offers primary care, oral exams and general community health visits. In 2014 a laboratory van Malla, was added to the fleet. The third stage saw the launch of EMS Home Mobile Clinic service in 2016 with the theme 'ER in Your Living Room'. EKSOTE also has a mobile van Tahoe, which focuses on at-risk youth. ('Taho' is a play on words and roughly translates to 'Wanna' as in 'I don't wanna').



The EKSOTE Mallu van. Image: EKSOTE, Mikko Nikkinen

The Mallu van provides appointments with a nurse practitioner and a telehealth connection with a physician. Typical services offered from the Mallu van are also immunization clinics, dental exams, and primary care visits to residential care homes. The Mallu van has room for one recliner and can be operated by a single staff member (e.g. dental hygienist or a community health nurse) with a truck driver's license. The van operates throughout the year and is now replacing a health center near Lappeenranta that had to be closed due to population decline – the critical number proved to be a census of under 1000 inhabitants. The van has become the new 'health center' and in some cases brings the care closer to the patients than before. On its scheduled routes, most visits at the van are by appointment, and a typical arrangement will see the van arrive on location with the waiting area being provided inside a community building. The longest distance the Mallu van covers is about 100 kms, and the providers soon learned to schedule visits to not coincide with days when bus transport out to other services was offered as this led to the van sitting empty. Once established, the Mallu catchment achieved the highest national coverage of influenza immunizations in the 65 and over age group, at 67%.

The second van in the EKSOTE mobile fleet is the laboratory van called Malla. It makes scheduled rounds and provides a laboratory testing service including blood draws, EKG, fungal and gynecological samples as well as collecting samples brought in by clients. All appointments are booked in advance

through an electronic reservation system. The Malla van is operated by a single staff member with a standard driver's license.

The next vehicles that were launched were the on-call fleet. These cars got named 'ER in Your Living Room' and are driven by a single nurse/paramedic. There are two of these cars and they only do home visits on call or as scheduled. The cars are equipped with portable technology for EKG, ultrasound, phlebotomy and other testing as well as a telehealth connection with a physician. The objective behind the 'ER in Your Living Room' service is to reduce unnecessary ER visits and to support aging in place, rehabilitation and living at home. When the service was launched, approximately 40% of ER visits in the region were deemed unnecessary, and the service was created to curb this number. In use it became evident that most calls for this service came during the daytime, therefore conventional ambulance fleet still handles all after hours calls. The house-calls provided by this service created an overall 33% cost saving in service delivery and 88% of the visits required no additional use of hospital resources. (Tepponen, 2019). Most importantly though, the clients provided feedback that they were far more satisfied as they received highly personalized care, on demand, at their homes.

From an administrative point of view, the Emergency room, emergency nursing services (both in- and outpatient) as well as the ambulance service are one integrated administrative unit. This coordination allows significant streamlining and the care is provided as close to home as possible (e.g. 43% of ambulance calls end up being treated on site with no need for hospital transfer).

The Tahoe van is mostly for psychosocial rehabilitation of youth and for hard to employ people, its main objective being to prevent disenfranchisement of members of the local communities. It is part of child and family services and one focus area is cases where high school aged youth are in danger of dropping out of school – reasons often include diminishing social contacts and disturbed daily rhythms due to gaming and device addictions. The van is staffed by a child and youth psychiatry outreach worker and a school social worker (from the client's school). A remote connection is used to connect with other school staff as appropriate. It is important to understand services like Tahoe as an essential tool in preventative medicine. (As comparison to the British Columbia numbers, between 2000 and 2017 all drug related deaths in Finland averaged 157 cases a year, a mere 10.4% of the Canadian level – another significant factor in the difference is the supply path of the drugs which has largely been traced to China).

The main principle behind the development of the mobile fleet in Finland has been the realization that centralizing services would be counterproductive to the qualitative objectives of the system. Finland, as a society is highly aware of global challenges such as climate change, and consequently receptive to paradigms that challenge old ways of thinking and constant growth – the answer is not always to 'build more'.



Interior of the EKSOTE laboratory service van, Malla. Image: EKSOTE, Kimmo Metsälä

A strong enabler for the success of the mobile fleet are the excellent electronic database systems in Finland and a skillfully centralized system of care management. All vehicles have a wireless connection to the patient records database with the call center care managers enjoying highest level of access. The care teams are completely integrated, as well as supported from within the system.

The care managers' competence is critical in assigning the appropriate response to calls received at the call center, and the field professionals can call the care managers to inquire about past assessments, discuss possible need for assisted living or other pertinent history. The home care nurses also know the status of the customer before the visit and what the general circumstances at the customer's home are. This eliminates the need for large amount of repetitive questioning and intake information at each visit even if the care provider changes.

The EKSOTE mobile fleet has significantly reduced the cost of providing service as numbers of unnecessary emergency visits have seen a dramatic decline. An EKSOTE calculation lists the costs of a hospital visit at € 940, an ambulance call with a visit at Emergency at € 650. In comparison, an assessment and care visit by the 'ER in your living room' service costs only € 276 per visit and in over four cases out of five eliminates the need for a visit to the Emergency (Tepponen, 2019). Client satisfaction has increased as services are now available at home or close to home (in the case of the

client going to meet the vans on their regular scheduled rounds). In some municipalities the vans run regular clinics at pre-determined stops at community buildings or centers.

From a technology point of view EKSOTE is in constant development phase – for example many of the workers still need to use the keyboard to browse patient and customer information from different data sources. Even though the system has undergone a long period of development the staff are still not fully at the point of autonomy of work where the systems release workers to independently use their education, knowledge and skills. EKSOTE continues its development and is currently building a further system of artificial intelligence to consolidate service data from all its databases.

The EKSOTE fleet in Finland is not typical of the country as a whole. The mobile service was created as a response to a situation where both resources and population were diminishing, but the care demand was going up. The care outcomes were not satisfactory and different levels of health services were used inappropriately. By switching to more holistic measures of social- and health outcomes and wellbeing with the help of artificial intelligence, the EKSOTE planners were able to assess their care more comprehensively. The mobile fleet represents both more focused use of resources and better patient centered care.

Discussion: More equality through mobile, tailored, low threshold healthcare services

The two very different cases presented in this paper illustrate that mobile care services play a significant role in ensuring the provision of care in circumstances of accelerating urbanization. We have presented here two different contexts, Vancouver's Downtown Eastside, a neighborhood subject to heavy pressure of gentrification in Canada, and a depopulating area in Finland, part of the Nordic welfare model context.

While protecting low-income housing in Vancouver has been used as a means to prevent displacement due to gentrification, we have demonstrated that the use of mobile health services might increase the possibility for even very vulnerable groups to stay put in radically changing city landscapes. The recognition of the persons with drug addiction by the health care services and the provision of tailored public services, could reduce the risk of displacement of the addicted at a later stage, as this typically happens as gentrification matures (e.g. Liempt & Chimienti 2017). The careful managing of the drug problem in place may give gentrifiers a sense of safety that allows them to co-habit with the addicted. At the same time, as Fast & Cunningham (2018, 255) have emphasized, mobile health services may also contribute to the normalizing of drug addiction, denying the suffering around it¹.

A number of researchers (e.g. Petryna 2004; Rose & Novas 2005) have concluded that biological citizenship has emerged as new form of citizenship, which is based on biology and the need for care rather than active participation in the social and political sphere. We have also argued, that with the

disadvantaged urban population, the mobile service provides the lowest threshold access to care (with the exception of on-the-ground drug and alcohol workers). Healthcare in Canada is publicly funded, but tied to provincial residency. In port cities such as Vancouver there is a large transient and homeless population who may or may not be covered by the Medical Services Plan. In the case of the MMU, a barrier to access has been lowered as anyone could avail themselves of the service provided as a response to the Public Health Emergency. This may also help in monitoring and understanding the actual population size in the Vancouver Downtown Eastside. It could be argued, that disadvantaged urban populations in this way are seen rather through their biological citizenship. Nevertheless, from a spatial justice perspective, mobile health care services offer a possibility to reach more citizens. It is not their location, not their status based on wealth or social power, but rather their biological citizenship that grants them access to care.

From the perspective of urban planning, mobile health services also challenge institutionalized ways of thinking about basic needs of residents within neighborhoods and residential areas. The paper has shown that mobile health services provide new possibilities for ageing in place. From this perspective they also challenge regional planning in Finland, allowing for new possibilities to live in more remote areas, while the trend today is to densify regional structures. The “grey tsunamis” or “age quakes” do not have to be viewed upon only as a problems, but also as points for innovation and new, cost effective and user friendly solutions. Nevertheless, the development of mobile health services calls for a closer, ongoing cross-institutional collaboration, as planners currently may not be well aware of new health care solutions such as the mobile health care services, or how best to leverage them in the service of spatial justice. On the other hand, changes in the provision of mobile health services may pose a real threat to aging in more remote places. This also emphasizes the need for ongoing collaboration between different sectors. Mobile health care services could also provide better opportunities for other population groups to stay put in the countryside as growing housing prices in more central areas is seen as one of the factors decreasing quality of life. Offering an attractive working environment with more flexibility, autonomy and ability to focus on the care work (instead of heavy administrative tasks), they may also increase the willingness of health care professionals to work in the public sector.



The first of many babies born in the BC Mobile Medical Unit. Image: Provincial Health Services Authority

Nevertheless, mobile health services also provide an important dimension of access to care, and thus relate to questions of spatial justice also in remote areas. Communities are poorly served as local service structure is often inadequate. Lack of transit and high cost of travel can be significant factors in foregoing treatment if it is not available locally. Another factor, especially with the elderly population, is not wanting to be a burden. Going to an appointment 'in town' may require assistance from a family member who may need to miss work or find substitutes. Bringing the service to the users eliminates these barriers in access to care and promotes equity and justice in healthcare delivery.

It is evident that mobile health services improve care outcomes, wellbeing as well as patient and family satisfaction. There is also a community building factor in the provision of mobile care. In Canada, the MMU is ideally staffed by medical professionals from the host community. This serves an important purpose of professional capacity building in the communities the unit visits. Many of the clinics and services provided are those for which the host community has no equipment (e.g. community hearing or respiratory therapy clinics). By providing the care platform, mobile services help foster self-sufficiency, dignity and independence of the communities.

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Footnotes

1. This is a compelling urban phenomenon, which deserves further research. It coincides with studies on the commodification of suffering, showing the need to problematize the starting points and motivations for for example humanitarian work. Malkki (2015) showed in the Finnish context, that those individuals who get engaged in humanitarian work with the elderly do that in order to escape their own loneliness Regardless of how important it may be to grasp the power relations between different actors in care work, it is beyond the scope of this paper. ↵