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IEGULDĪJUMS TAVĀ NĀKOTNĒ

Eiropas Savienības fondu darbības programmas "Izaugsme un nodarbinātība" 9.2.3.specifiskā atbalsta mērķa "Atbalstīt prioritāro (sirds un asinsvadu, onkoloģijas, perinatālā un neonatālā perioda un garīgās veselības) veselības jomu veselības tīklu attīstības vadlīniju un kvalitātes nodrošināšanas sistēmas izstrādi un ieviešanu, jo īpaši sociālās atstumtības un nabadzības riskam pakļauto iedzīvotāju veselības uzlabošanai" ietvaros īstenotā projekta Nr.9.2.3.0/15/I/001 "Veselības tīklu attīstības vadlīniju un kvalitātes nodrošināšanas sistēmas izstrāde un ieviešana prioritāro jomu ietvaros" nodevums Nr.12 - **Review of capital investment planning**

Capital Investment Planning Review[1]

1 Author: Sanigest Internacional.

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1. Introduction

1. This document presents an assessment of capital investment decision making in primary care and hospital settings in Latvia. It discusses a number of cases studies relevant for Latvia and draws on a framework for evaluating best practice in capital investment planning that was prepared based on a review of OECD countries. This analysis was conducted as part of a World Bank Group (WBG) reimbursable advisory services agreement with the Latvian National Health Service (NHS), which aims to provide "Support to Develop a Health System Strategy for Priority Disease Areas in Latvia."

2. Annual capital investment in Latvia's health sector is extremely limited with only €250 million projected for the next EU funding cycle. The investments made over the past decade have been limited and not targeted to addressing the disease burden or to ensuring strategic placement of the investments for furthering health system goals, such as improving health outcomes, financial protection, or system responsiveness. The question of value-for-money with these resources, and even with existing resources, are under increasing scrutiny as the country endeavors to ensure affordable, equitable, and effective health care.

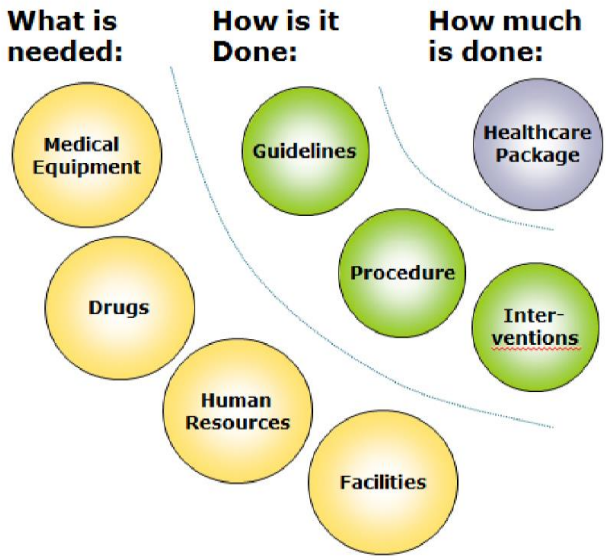
3. This review suggests that capital investments in Latvia are currently not conducive to rational service delivery and planning. Routine capital planning and investment are not population or needs-based. Rather they appear driven by targets related to the number of beds or the availability of investment budget. The delivery system in Latvia is structurally unbalanced, and current capital investment planning may contribute to an oversupply of acute beds and facilities that are ill-suited to address the country's disease burden, which is dominated by chronic diseases. Current capital planning strategies appear to favor hospital expansion while there is little consideration of how to (re) configure a regionalized, primary-care centered, and integrated delivery system. Moreover, rapidly changing medical, pharmaceutical, and communication technologies may make hospitals - as currently designed - over-dimensioned and obsolete well before their planned "useful" life comes to an end. Latvia can learn from international experiences, in which more strategic planning has overcome such challenges.

4. The rest of the document is organized as follows. The next section presents and discusses seven cases studies in capital investment planning from OECD countries that have important lessons for Latvia. It also describes the steps required for disease-oriented planning, using stroke care as an illustrative example. The third section assesses Latvia's capacity for capital investment planning, using a maturity model developed from a review of OECD experience and information gleaned from desk reviews and on-site interviews. Another deliverable of the World Bank's advisory services – namely, the infrastructure and human resource maps and master plan – assesses the actual performance of capital investment planning in terms of the gaps between needs and current investment, as well as lays out specific policy solutions that could be worth pursuing to improve the value-for-money of future capital investments.

2. International experience in capital investment planning

5. The transition many of the OECD countries have made over the past decade away from hospital care and towards community care settings provides important lessons learned for Latvia moving forward. A review was carried out which looks at the shift in care provision and the trends in capital investment planning and investments. The image in Figure 1 shows how best practice involves linking the benefit package, the protocols or proposed interventions, and the definition of the resources required to meet the service demand. The approach integrates healthcare needs, population disease profiles, patient demographics, national clinical practice guidelines, medical device availability, technology requirements and constraints and system capacity for management. It links these parameters to the resources needed to deliver a defined set of health interventions in a defined set of health interventions – for example, a package of healthcare services for primary care or hospital care.

Figure 1 Best Practice in Healthcare Package Implementation



6. Based on the previous visualization of the link between the services and the infrastructure needed, best practice among OECD countries is quickly evolving to consider the following elements:

    1) Needs based planning linked to specific health challenges such as chronic diseases;
    2) A long-term perspective – demographic, epidemiological and urban development plans;
    3) Bed, technology and facility requirements based on estimated service provision levels, lengths of stay, and productivity estimates to determine required supply;
    4) A focus on integrated networks delivering services required by catchment populations;
    5) CAPEX allocations to provinces that correct for equity and level of deprivation;
    6) Use of spatial analysis with GIS to ensure equitable access;

7) Increased proportion of outpatient care, including primary care, day surgery and day hospitals;
8) An increase in general hospitals with fewer mono-profile facilities and creation of centers of excellence based on high volume specialties, such as burn centers or cancer care; integrated perspective for buildings, people, technology;
9) Partnership with private sector to reach health system goals and to offset the need for further public investment; and
10) Private sector capacity to deliver care in non-hospital segments through PPP arrangements.

7. Latvia is not alone in its efforts to transition its capital investment strategy from one that is driven by hospital infrastructure to one that is driven by service planning to respond to real population needs. Several OECD countries have made or are making this transition, and their experiences offer important lessons for Latvia.

8. OECD countries, although diverse, face a myriad of common challenges when it comes to capital investment for health: the demographic and epidemiological transitions associated with an ageing population, advances in medical technologies and pharmaceuticals, rising public expectations, persistent health inequalities, and, in some cases, less resources available for public spending. In the face of upward pressure on health expenditure as a share of gross domestic product (GDP), there is increasing recognition of the need to improve the efficiency and effectiveness of health systems (OECD 2008). The challenge for these countries, as well as for Latvia, is to reconcile health needs, public and professional expectations, and available resources.

9. Another major challenge that OECD countries and Latvia need to keep in mind is the lengthy time periods involved in planning, financing, construction, and operation. The interval between concept and commissioning of major hospitals can range from 5 to 10 years, while several more years are needed to construct the hospital. This has implications both for hospital sustainability and for responsiveness of healthcare delivery to population needs. The long time period from commissioning to operation can mean that many hospitals, when beginning to operate, do not meet the current (or future) health needs of their population.

10. Meanwhile, population needs are constantly shifting. Healthcare demand is highly sensitive to variations in the hospital's catchment population, including demographic changes and migration patterns. The dynamic context of hospitals makes demand difficult to predict, both in terms of quantity and type of use. Furthermore, medical technologies have advanced rapidly since the 1970s, with a far-reaching impact on demand for clinical services. Ensuring that hospitals created today can retain their relevance and value in the future is a profound challenge. Although providing health care goes beyond physical assets, they are the starting point in the delivery of sustainable and high-quality clinical services at the right place and the right time. This means that the design of hospitals should be sufficiently flexible to meet new requirements (Rechel et al 2009b).

11. The following sections provide demonstrative case studies from OECD countries from which lessons can be drawn for Latvia. Although these examples are culled from countries with better funded health systems, nonetheless many of the lessons learned, in particular from Spain, the Netherlands, and Northern Ireland, can be adapted for the Latvian context. The case studies

provide a variety of perspectives on how the challenges outlined above can be met. (Note: the European case studies are adapted from Rechel et al (2009), while the others come from other sources and are cited accordingly).

12. The case studies demonstrate a variety of different approaches to adopting a service-based capital investment strategy – from incorporating flexibility and future-proofing design principles in the Netherlands, to overhauling regional capital investment in Northern Ireland, to involving the private sector in Spain, Finland, and England. Also included is a case study focused on how service-based capital investment can respond to specific disease-related needs.

13. Although the case studies are diverse, common themes can be identified related to how the supply of health services can respond to population needs. For example, there is a clear trend towards using systemized care pathways as a means of characterizing the provision of health care services, including their linkage and integration with capital investment. Care pathways aim to describe the health care services required for specified disease syndromes and where they should be provided. Ideally, they would encapsulate measurable inputs and outcomes. They provide a possible basis for translating demographic and epidemiological trends into concepts that can be used for planning health capital investment. Furthermore, they offer a means of engaging with clinicians while simultaneously providing levers for economic control. Care pathways are likely to have greatest impact on health capital investment when they are applied across care settings and not only to hospitals, and when they are backed by appropriate systems of resource allocation (Hindle, Dowdeswell & Yasbeck 2004).

14. In addition, the case studies also highlight the need for comprehensive systems of capacity planning and for the use of new measures of hospital capacity that go beyond bed numbers. Using bed numbers to measure hospital capacity, although obsolete, is still used by many countries (both OECD and non-OECD). Other countries are seeking measurements derived from systemized care pathways, or at least more closely linked to actual capacity rather than bed numbers. For example, the Coxa Hospital in Finland was designed around care pathways, with particular attention being paid to work process systematization that allows patients to flow smoothly through the system. However, this is a methodology that is still in its infancy, and more work is needed to develop a reliable and robust characterization of hospital capacity other than one based on bed numbers.

15. Finally, the case studies demonstrate the need for linking the operation of hospitals with flexible financing models. The time periods for renewing medical technologies and buildings are becoming shorter, and issues of the life-cycle effectiveness and economic sustainability of hospitals are being recognized as more important. Those hospital projects that have sought to design more adaptable buildings and services have also tended to turn to more adaptable capital financing models, such as the Private Finance Initiative in England. Table 1 includes a taxonomy of the capital investment strategies in the case studies explored.

Table 1 Taxonomy of Capital Investment in International Case Studies

Example	Type of Capital Investment	Regional and/or national	Timeline to implement	Infrastructure and/or Equipment
Martini Teaching Hospital (Groningen, Netherlands)	Service-based	Regional	1991-2008	Infrastructure
Northern Ireland	Transitioning to service based	Regional	2007-2027	Infrastructure and equipment
Alzira model (Valencia region, Spain)	Transitioning to service-based	Regional*	1999-2018	Infrastructure and equipment
Coxa Hospital (Finland)	Service-based	Regional	1990-2002	Infrastructure
Private Finance Initiative (England)	Transitioning to service-based	National	Up to 30 years	Infrastructure
Interior Health (British Columbia, Canada)	Service-based	Regional	2013-2023	Infrastructure and equipment
Certificate of Need program (Maine, USA)	Service-based	Regional	N/A	Infrastructure and equipment

Source: Sanigest Internacional; adapted from Ashcroft & Broome 2011, Interior Health 2013, & Rechel et al 2009b

*with oversight by the Ministry of Health and Social Services

2.1 Capital Investment Planning for the Future in Groningen, Netherlands

16. A major challenge in designing hospitals to be sustainable and to meet long-term needs is the lengthy time periods involved in planning, financing, and construction. The interval between concept and commissioning of major hospitals can range from 5 to 10 years, while many more years are needed for construction. This can mean that by the time hospitals are ready for operation, they may not meet the current (or future) health needs of their population.

17. The Martini Teaching Hospital in Groningen, Netherlands is an example of how a hospital can incorporate flexibility and future-proofing methods to better respond to rapidly changing health needs and advances in service delivery and technologies. Construction of the Martini Hospital placed particular emphasis on the future adaptability of the building, based on flexible design features. The Martini Hospital was born out of a merger of two medium-sized hospitals in Groningen in 1991. Over many years of planning and careful design, the clinical, teaching, and administrative functions of the Martini Hospital were combined on a single site.

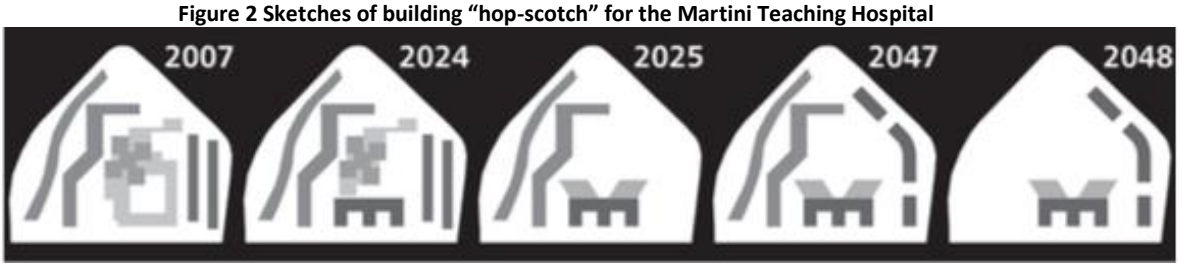
Flexible, Future-oriented Design

18. The re-design of the Martini Teaching Hospital was based on three key elements: flexibility, logistical division of care processes, and future-proofing.

Flexibility

19. Flexibility and adaptability were emphasized in the re-construction plan of the Martini Hospital, allowing it to grow (or shrink) in response to the changing needs of its users and to rapid changes in health care. To incorporate flexibility in the re-design, the architects borrowed design principles from industrial buildings. For example, Figure 2 shows the "hop-scotch" approach taken for the design of the new hospital buildings. The 2007 sketch shows how new buildings were constricted to the left side of the existing hospital. Subsequent sketches show how the vision will develop to make optimum use of the space over the coming decades. As buildings reach the end of their life-cycle they can be removed through a sophisticated architectural "hop-scotch," and new structures can be constructed alongside, if needed.

Figure 2 Sketches of building "hop-scotch" for the Martini Teaching Hospital



Source: Rechel et al, 2009b

20. The architects also incorporated design principles that would allow for the future possibility of converting the new hospital buildings into office or residential accommodation once the space is no longer needed for the hospital. For example, narrower building dimensions were used, central technical facilities and stairs/elevators were housed between hospital blocks, and cabling and ducting was routed through insulated pipes externally. This maintains maximum adaptability of the internal space for any future rearrangements. Because of the large degree of flexibility at more than one level of the overall design, the hospital is expected to be able to accommodate easily any changes in health care, resulting in an element of "future-proofing."

Logistics

21. The Martini Hospital has opted for a care model in which acute and elective care are treated separately, so that the logistics associated with these functions can be optimized. This concept has been designed into the new buildings, enabling those wards that normally interact to be linked horizontally and/or vertically, while minimizing disruptions (i.e. of elective care by acute care). In the case of high dependency or unplanned care, this concept is expressed through the vertical connections (i.e. elevators) between emergency care, the coronary care unit, high-tech imaging, intensive care, delivery rooms, the burns unit and operating rooms. Horizontally, there

is a functional coherence between the operating room complex, the intensive care unit and the burns unit.

22. Whereas the guiding principle for the emergency part of the hospital is the input of patients, for the elective part it is the output from operating theatres. With an ever-increasing volume of day cases, the key determinant of patient flow across the system is the speed at which a patient can be transferred from the operating theatre to day care, via as short a stay as possible in the recovery suite. This is achieved by linking the recovery rooms and the day care units physically together with an "overflow" area. As the supply of patients to the recovery unit increases, the overflow area is pressed into service; as the day proceeds, the recovery unit empties, but day care units become fuller and the overflow area relieves the pressure in the other direction.

Future-Proofing

23. The philosophy behind the new construction plan was to be able to offer a new flexible "future-proof" hospital that can easily and affordably adapt to future changes in health care. In addition to the flexible design principles described earlier, future-proofing was achieved through standardization. Standardizing wards means that their functional use is not defined by their dimensions, nor by "belonging" to a specific department. The effect of this is that wards are themselves flexible: their size and configuration depends on the numbers in a particular patient category, rather than being predetermined by allocation to a particular specialty. Standardization ensures that, should needs change in the future, it is relatively easy to create an outpatient department in the space currently reserved for a ward, or to convert an existing outpatient department into an office.

2.2 Regional Capital Planning in Northern Ireland

24. Northern Ireland's ambitious capital investment program, expected to amount to £4.5 billion (€5 billion) over 10 years, moves away from a hospital-centered form of regional planning towards one that integrates primary and community health services and encompasses the whole spectrum of health care and social services. The future Northern Ireland health model aims to focus on health promotion and illness prevention, with improved accessibility of diagnostics and earlier interventions delivered in communities closer to where people live. The model envisages a major emphasis on better management of chronic disease, with the objective of improving quality of life and preventing unnecessary hospitalization.

25. It is important to acknowledge that, due to the scale of capital investment, this model might not be easily replicable elsewhere. However, there are still important lessons to be learned from the Northern Irish experience with integrating capital investment planning with all levels of healthcare.

Enhanced Community Services & Concentration of Complex Services

26. The reform of health capital investment, based on service-need, began in 2007. Prior to 2007, capital investment was largely focused on the acute sector. The new model sought to create an integrated continuum of facilities, from home care through to primary, community, sub-acute/step-down, and acute facilities, all supported by structured networks. An emerging consensus on the future delivery of services had two main components: enhanced services within the community and concentration of complex services.

27. With regards to the first component, after a comprehensive region-wide planning exercise, the decision was made to develop 42 new community health centers located at population centers throughout Northern Ireland. Meeting the second component requires greater centralization – from local general hospitals to acute centres or to regional centres of excellence – of those services that, due to their complexity, require specialized skills and expertise that cannot easily or affordably be replicated in local hospitals. A key criterion in the process of determining the final locations of those hospitals to be designated as "acute" was that patients should have a maximum travel time of one hour from anywhere in Northern Ireland to an acute facility with full accident and emergency services. As part of this centralization process, smaller local hospitals will be reconfigured in terms of clinical profile and service need.

28. The physical redesign of the health system in Northern Ireland will comprise five key elements (depicted in Figure 3), and the typical range of services intended to be provided at each level is outlined in Table 2 below.

i. The reduction of Health and Social Care Trusts (service provider organizations) from 17 to 5, according to geographic need, each providing a full continuum of health and social care services to their local population;

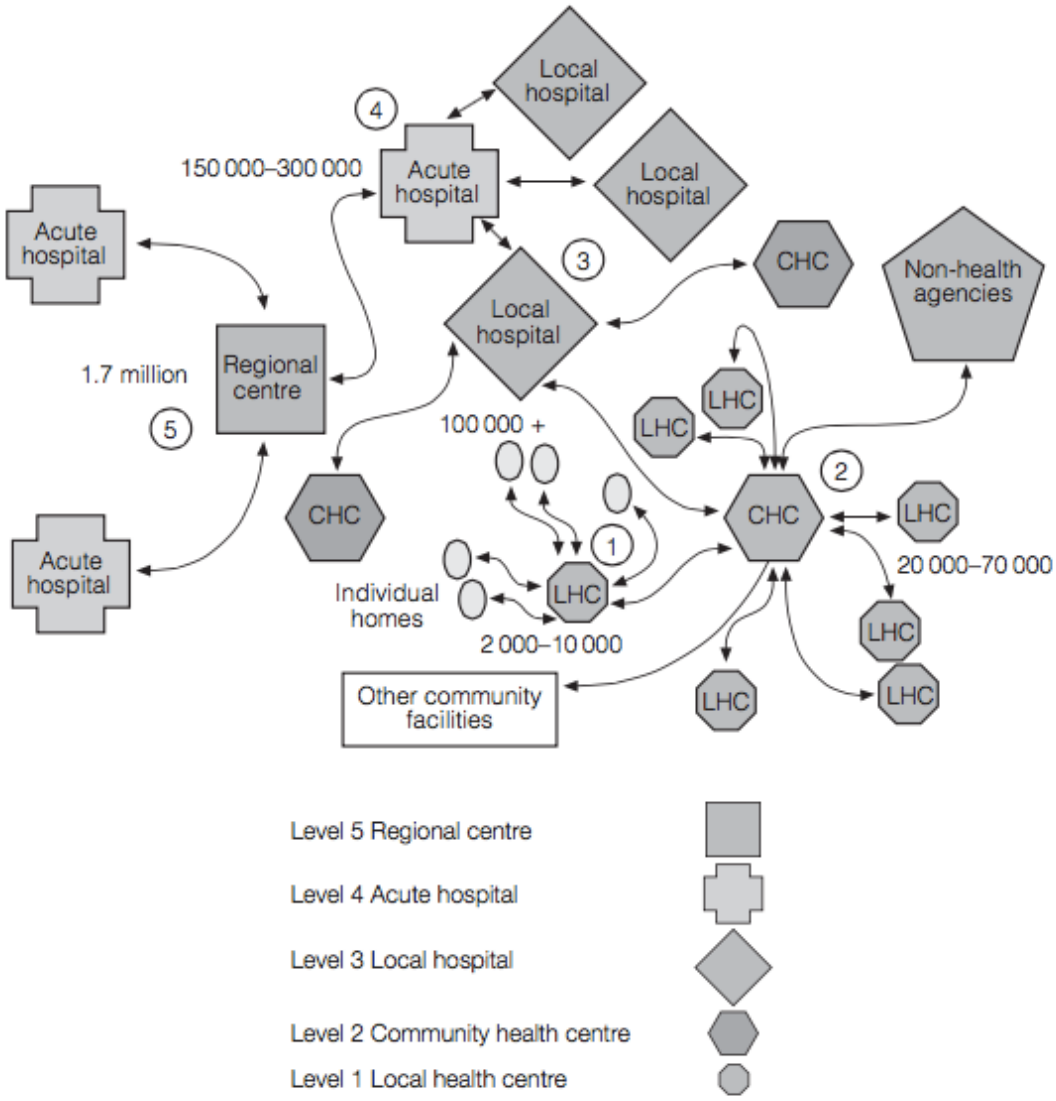
ii. The designation or development of regional centers as the sole providers of a range of tertiary services that will benefit from centralization;

iii. The reduction in the number of general hospitals providing the full range of acute services from 18 to 10;

iv. The redevelopment of seven of the remaining nine hospitals as new non-acute step-down facilities with a focus on their local communities and the ability to provide a wider range of intermediate care services;

v. The creation of 42 new one-stop community health centers (without bed accommodation) with the key objective of preventing unnecessary hospitalization. The local hospitals will facilitate earlier discharge from the acute hospitals and reduce current levels of "bed-blocking" by patients at a stage in their treatment at which they need rehabilitative rather than acute care. They will also provide a link between the 42 new one-stop community facilities and the 10 acute hospitals.

Figure 3 Northern Ireland's Integrated Services Model



Source: Rechel et al, 2009b

Table 2 Services offered under each level of Northern Ireland's integrated services model

Level	Range of Services
Level 1: Local Health Centres - Construction cost range: £1-5 million - Level 1 facilities will frequently be incorporated into Level 2 facilities	• General practices • Non-complex diagnostic testing • Basic treatments and nurse-care • A limited range of therapies
Level 2: Community Health Centers - Construction cost range: £5-15 million	• Out-of-hours GP service • Outpatient clinics • Minor procedures • Non-complex imaging and diagnostics

	● Children's services ● Physiotherapy ● Speech therapy ● Podiatry ● Dental services ● Social services ● Mental health services ● Multidisciplinary outreach teams ● Voluntary sector ● Community facilities ● Pharmacy
Level 3: Local Hospitals - Construction cost range: £40-70 million	● Urgent Care Centre (as opposed to full accident and emergency care) ● Ambulatory care centre ● Full diagnostics including radiological services ● Day procedures/day surgery unit (Level 3 facilities can be designated to act as "protected elective centres") ● Step-down, rehabilitation and GP beds ● Mental health unit ● Support services
Level 4: Acute Hospitals - Construction cost range: £200-300 million	Full range of standard acute hospital services, including: ● specialist-led accident and emergency care ● critical care department ● acute medical and surgical departments ● paediatrics ● outpatient department ● radiology
Level 5: Regional centres of excellence - Construction cost varies - Generally, but not always, co-located with a Level 4 acute hospital	For example: ● Cancer treatment services ● Orthopaedic services ● Cardiac surgery ● Neurosurgery

Source: Adapted from Rechel et al, 2009b

29. A primary objective of this new model of care is to improve accessibility to the public of high-quality and timely services. The co-location of Level 1 and Level 2 facilities has been encouraged within the model, particularly in areas of high population density, where travel distances are more likely to be acceptable for access to general practitioners. Where sites for Level 3 and/or Level 4 facilities are already located at natural population centers with good access to public transport, there are potential benefits in co-locating Level 1 and Level 2 facilities, while ensuring the retention of their separate identities and organizational structures. Where such co-location is proposed, the resultant arrangement has come to be referred to as "a health village." The specific location of individual facilities was determined by a number of key factors, including: the core principles within the regional health strategy, urban or rural setting, size of the local population, epidemiology, travel times and distances, critical mass for staff, critical mass for

specialist equipment, state and location of current facilities, improved accessibility, reduced waiting times and reduced hospital admissions, and affordability.

30. Additionally, similar to the Martini Teaching Hospital in the Netherlands, Northern Ireland has attempted to incorporate flexible design principles into its new configuration. For example, phased construction, similar to the "hopscotch design," was adopted to transition from existing to new facilities; the insertion of "soft" space (for example, office or educational accommodation that can be relatively easily relocated) beside complex areas, such as those for critical care or imaging, that are likely to expand in the future and would be very expensive to move; and standardization.

2.3 The Alzira Model: The First Public-Private Partnership Hospital in Spain

31. The Alzira model in the Valencia region of Spain began as a green-field acute care hospital developed through a public-private partnership but later transitioned into providing all levels of care for the population in its area, funded through capitation payments. The use of private capital offered an interesting approach to reduce the burden on public expenditure and to take advantage of private management and efficiency to drive value-for-money. The use of PPP models in Latvia may offer interesting options to leverage limited EU or public funds for future investment in the health sector.

32. In Spain, health care services are planned and delivered regionally, with oversight by the Ministry of Health and Social Services. Despite a 1986 General Health Care Act that prioritized the development of primary health care, hospitals continued to dominate the country's health care landscape. In 1991, the April Commission criticized the lack of efficiency and flexibility of hospital management within the Spanish health system and established a new legislative basis for the involvement of the private sector in the delivery of health care. This legislation allowed the private sector to deliver public health services but maintained regional control over health services planning.

33. In the wake of the April Commission, Valencia considered a new capital investment model in order to fill a gap in health care delivery. The city of Alzira was one of few Valencia communities without a local hospital; inhabitants seeking treatment often had to travel more than 40km. To close this gap in health care provision, Valencia issued a request for tenders to build and run a new public hospital (the Hospital de la Ribera) using private capital. Proposals for the Hospital de la Ribera involved an innovative public-private approach, whereby the private company is responsible for the population's full-service hospital provision. This model is known as an administrative concession or the Alzira model.

34. The private company that won the bid for the Hospital de la Ribera was the *Union Temporal de Empresas-Ribera* (Temporary Union of Companies) (UTE). By 2009, the hospital that was built by UTE served a catchment population of nearly 245,000 people. Since the establishment of this first administrative concession model, other Alzira models have been granted in Valencia. They now cover almost 20% of the population of the Valencia autonomous community.

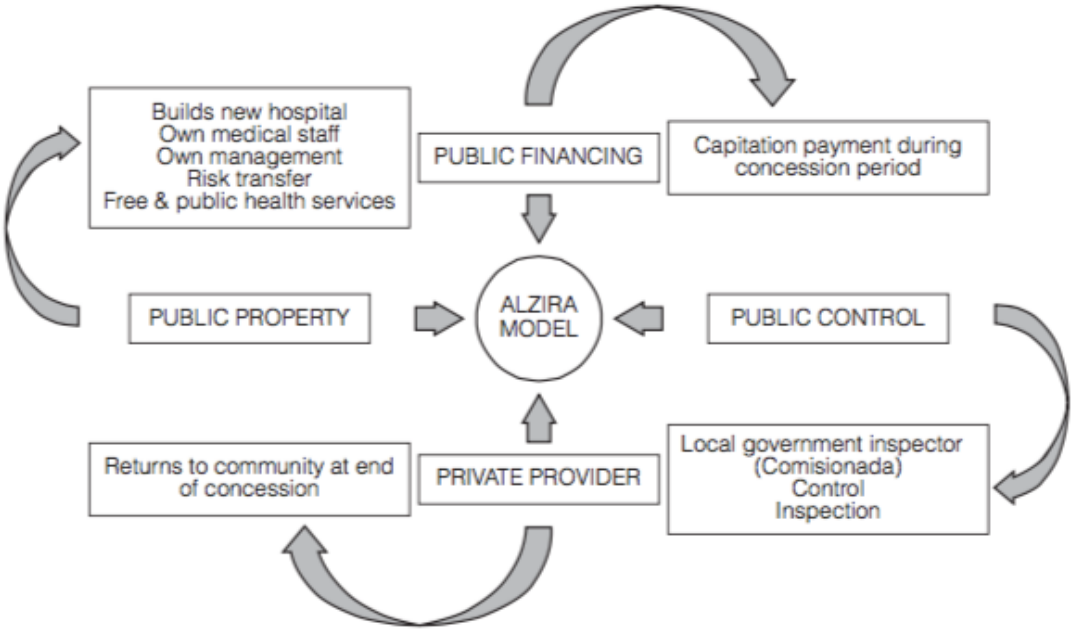
35. In its initial phase, the Alzira model envisaged only the delivery of hospital care at the Hospital de la Ribera. However, it was soon realized that there were potential problems with cost shifting between primary and secondary care, and it was necessary to consider the overall health needs of the population. This realization coincided with the recognition that the initial model was

inadequately budgeted and faced financial difficulties. In 2003, a new organizational model was put in place, in which the company assumed responsibility for delivering health care in both primary and secondary settings. Through this new model, Alzira avoided the fate of the first generation of public–private partnership hospitals in Australia in the early 1990s that failed to operate at a profit, in part because they lacked the possibility of rebalancing service delivery between hospital and primary care.

Basic Principles of the Alzira Model

36. The basic principles of the Alzira model, depicted in Figure 4 below, are outlined in the remainder of this section. There are four basic principles of the Alzira model: public financing, public control, public property, and private management. The thread connecting these four basic principles of the Alzira model is "money follows the patient." That is, the model is financed on a capitation basis (where payment is based on the number of patients enrolled); therefore, there is an incentive to deliver health services that meet the needs of patients, in order to achieve patient loyalty.

Figure 4 The Alzira Model



Source: Rechel et al, 2009b

Public Financing

37. The Alzira model is financed on a capitation basis by the local government. The Valencia government pays an annual fixed sum for each of the registered inhabitants of the Alzira area, all of whom have an electronic health card. Since "money follows the patient," the Valencia government can predict the annual cost of health services delivered by the Hospital de la Ribera. In return, the company must offer universal access to its wide range of services. In effect, there is a transfer of risk, as the budget of the Valencia government is both predictable and limited.

38. The Hospital de la Ribera is responsible for all hospital care of patients registered in the health area, wherever they are treated. If patients are treated in hospitals elsewhere, the Hospital de la Ribera assumes 100% of the cost, based on the relevant DRG. Hospitals in other parts of the Valencia region do not lose money if local inhabitants go elsewhere. However, as a disincentive for the hospital to use its capacity for patients from elsewhere, in such cases a hospital is only reimbursed for 80% of the cost (priced per DRG) for each patient treated from another Health Department.

Public Control

39. The Alzira model is a public–private partnership in which, according to the terms of the administrative concession, the hospital has to meet targets set by the Valencia government. Targets (such as waiting times or immunization rates) have to be at least as high as those achieved by other Health Departments for the rest of Valencia's citizens. Because "money follows the patient," the hospital has an incentive to maintain high standards in meeting these targets in order to retain the loyalty of patients.

Public Property

40. Under the Alzira model, the private company (in this case, UTE) is required to maintain its structures and equipment in good condition until the end of the concession, when they will revert to the regional health ministry. At the beginning of the concession, the condition of all the premises transferred from the Health Department was audited and registered; when they are transferred back to the local government at the end of the concession they must be in at least the same condition. If not, the company must bring them up to standard.

41. For this reason, UTE has made substantial investments in the Hospital de la Ribera during the concession period. For example, during the second period of the administrative concession, UTE built a new and fully equipped Health Centre, Alzira II (€6 million investment), and has renovated other health centres and invested in new equipment.

Private delivery/Management

42. As noted earlier, during the period of the administrative concession, UTE is responsible for the provision of health care to the Ribera area within an annual budget calculated on a capitation basis. As is the case in the rest of Spain, health services are free at the point of use to all inhabitants of that Health Department. The company has adopted management concepts from the private sector, reflecting its view that public management of health care in Spain has been bureaucratic and inefficient and that a private company can achieve better results using its own medical staff and management tools.

43. At the beginning of the concession, it was very important to achieve patient loyalty, so the main policies adhered to within the Alzira model were patient-orientated, including:

    - free access to medical specialties, without – initially at least – any gatekeeping function by primary care;
    - free choice of medical specialists and hospitals;
    - a wider range of outpatient and elective surgery times;
    - shorter waiting times.

These policies also attracted patients from other Health Departments with longer waiting lists, with the cost of their care being charged to the respective local government (80% of the DRG cost, as already mentioned).

Alzira Model II

44. During the second phase of the administrative concession, UTE became an integrated health care organization. This required new working methods, including creating integrated medical processes (identifying the most appropriate diagnostic and therapeutic pathways); investment in additional diagnostic tools in primary care, complemented by direct access to radiology, endoscopy, pathology tests, and so on; and creation of a network of information systems, so that information could be shared by all medical professionals (integrated patient medical dossiers). Certain policies have been implemented to facilitate this integration, as detailed here.

45. Second phase investments included:

    - building one new Health Centre and remodeling and updating others
    - a new Haemodialysis Unit
    - a new Interventional Radiology Unit
    - a new Medical Physics Gamma Camera.

    As a result, the company made a profit of more than €2 million from 2003-2007.

46. Although the Alzira model has not yet been subject to a formal evaluation, so far it has been viewed positively by patients, staff, the central administration, and the private consortium (UTE). The public administration in Valencia benefits from the Alzira model because it did not have to spend the resources for the initial investment (€68 million) to build a new hospital. Moreover, the "indirect management" seems to lead to better use of public resources, more efficiency, an increased volume of activities, better service provision, and a higher number of citizens satisfied with the government performance. In the past six months, however, the government has been in the process of taking back the asset to be managed publicly again after a series of ideological debates in Spain regarding private capital and management in health. ///

2.4 Private Sector Involvement in Capital Investment in Finland

47. Coxa Hospital, Finland is another example of private sector involvement in capital investment. The public and private sectors hold shares in the Coxa Hospital, thus endowing it with characteristics of a public–private partnership. While Coxa is subject to public sector regulation and interacts extensively with the public sector, it has also taken advantage of opportunities to enter the European market for hospital care.

48. The Coxa model contrasts with other examples where market forces have shaped provider systems and structures. In the next case study from the United Kingdom, for example, a secondary market has opened up to trade in contracts, and there is little intrinsic interest in health care on the part of the purchasers, who aim to exploit the payment stream within the PFI contract structures.

49. The experience of the Coxa Hospital illustrates the importance of focusing on quality and well-defined processes, and integrating those into patient pathways and facility design, as well as

ensuring staff well-being. Evidence from the PFI experience in the United Kingdom suggests that commercial interests predominate where the investors have little intrinsic subscription to health care values.

Set-up of the Coxa Hospital

50. The Finnish healthcare system is highly decentralized. Health care delivery is organized at the municipal level, with oversight from the provinces, which are responsible for the approval of capital investment plans. The Coxa Hospital for Joint Replacement, which specializes in endoprosthetic surgery, is located in Tampere, a city in the Pirkanmaa district. Following a 1990 national study that revealed problems of quality in endoprosthetic surgery in many hospital districts, the Pirkanmaa hospital district sought to centralize endoprosthetic care. The study projected that there would be a need for a doubling of hip replacements from the late 1990s to 2015 as a consequence of an ageing population. This presented an opportunity for the Coxa Hospital to respond to a growing market need for endoprosthetic surgery.

51. An independent firm commissioned by Pirkanmaa to review options for the Coxa Hospital suggested that by concentrating services and introducing new models of care, capacity could be significantly enhanced, costs reduced by one third, and quality improved. The subsequent development of the Coxa model illustrates important lessons for large-scale capital investment projects. The core principles of the concept were as follows:

    - creating care pathways that spanned the hospital district;
    - systematization of work processes;
    - focusing on staff motivation by delegating ownership of the process to employees;
    - incorporating the principles of lean management;
    - integration of these approaches to achieve advantages of scale.

    In practice, for endoprosthetic surgery, this meant:

    - withdrawing services from five district hospitals and concentrating them at the new Coxa Hospital;
    - agreeing on integrated and systemized care pathways, involving GPs and other local orthopaedic specialists in a network of care, with Coxa focusing on operative procedures and pre-admission and post-operative rehabilitation undertaken in the primary care sector, close to the patients' homes;
    - guaranteeing a quality and cost package that was efficient enough to release funds back into the health system for other uses.

52. Two options were considered for a reformed Coxa hospital: a public utility or a limited company. The preferences were for the latter, for the following reasons: (i) Coxa would operate within the Pirkanmaa hospital district, but could sell services to other health districts, within Finland or within Europe; (ii) the independence of a limited company would allow Coxa to adapt to changing market circumstances; and (iii) limited company status would free the hospital from the rigidities of public institutions, and it would no longer depend on public sector capital. Given these benefits, the Coxa hospital became a limited company, under a public-private partnership.

However, in contrast with many public-private partnerships, the public sector holds the majority shares.

Coxa's Capital Investment

53. Although the initial plan for the Coxa Hospital was to lease premises from the Pirkanmaa hospital district, it was later determined that there was long-term value in holding capital assets. The chosen route for capital investment was to tender for a full turnkey design-and-build operation, with penalty clauses for any default in terms of time.

54. The Coxa team made considerable efforts to incorporate translation of service needs into design solutions. Architects tendering for the design contracts were provided with all of the hospital's proposed (systemized) care pathways, with an emphasis on current and anticipated service dynamics. The successful design was produced by architect Pekka Koivula, and the construction awarded to Engel Ltd in March 2001. The project, developed on the Tampere University Hospital site, was completed on time and within cost constraints, and the hospital opened in September 2002.

55. A further feature of the project was the integration of information and communication technology (ICT) into the design and construction of the building, in contrast to many cases where ICT considerations are often grafted in late, with predictable problems of fit and effectiveness.

    In summary, the key features of the technical and financial solutions for Coxa were:

    - outsourcing of many aspects of the design and construction of the new hospital;
    - minimal outsourcing of technical skills (apart from design and construction, and ICT);
    - an innovative public–private partnership model with transparent public– private ownership and balanced influence at the board level;
    - a turnkey design-and-build procurement process;
    - an architectural concept built on the foundation of core (systemized) work practices, with the aim of ensuring life-cycle sustainability through adaptable design characteristics;
    - independently sourced capital financing through a commercial bank;
    - integrated ICT systems.

2.5 The Private Finance Initiative in England

56. In contrast with the other case study examples, the National Health Service (NHS) in England has relied exclusively on the Private Finance Initiative (PFI) as a way of financing new hospital projects. The PFI is a mechanism through which the UK government creates PPPs to fund public infrastructure projects with private capital. A PFI contract involves the public authority's transferring the design, construction, operation, and financing of the infrastructure asset to a private organization. Under this model, the private organization finances the project and has full responsibility for its operations and maintenance. Another characteristic of PFI is the long-term duration of the contract – typically 30 years – designed to allow the private company to reap the rewards of its investment.

57. In 1997, the first wave of 14 PFI hospital projects were secured, worth an estimated £1.3 billion. Since then, the NHS has became the leading exponent of the PFI in England, embarking on the

largest hospital building program in the history of the NHS, with over 139 hospital building projects approved between 1997 and November 2008.

Norfolk and Norwich University Hospitals

58. The Norfolk and Norwich University Hospitals are good examples of a PFI project. By the late 1990s, the existing hospital buildings within the Norfolk and Norwich Trust were old, worn out, and their backlog maintenance was in excess of £20 million (€21 million), so there was urgent need for a modernized hospital facility. Under a minimum contract period of 34 years, the selected private company developed a new hospital on an out-of-town green-field site.

59. The strategy used to predict future population needs for the new hospital was relatively conservative. Initially, a decline in the inpatient case-load during the first operational phase of the project was assumed. This was based on "deaths and discharges" as an output indicator, rather than "finished consultant episodes", which is more commonly used to project clinical demand. The design for the new hospital was developed on the basis of this reduced expected demand, based on the number of admissions in 1994. However, admissions across all specialties rose by 4.1% annually during the initial construction period, and day-case admissions rose by more than 14% per year in this period. The projected number of discharges and deaths expected in 2003–2004 had already been exceeded in 1996–1997. The Norfolk and Norwich PPP therefore had to revise its clinical demand estimates and increased bed numbers during the tendering phase. However, even this new number was based on a conservative prediction of future demand levels and envisaged maximum bed occupancy. The capacity had to be increased still further, as demand for clinical services appeared to be growing during the construction phase. The repeated use of conservative planning strategies provides little confidence that the new facility is appropriately sized and sufficiently flexible for future use.

60. According to the Norfolk and Norwich PPP, the design of the hospital is far more flexible than that of its former hospitals. The hospital is designed in such a way that it can grow and adapt to the changing needs of the local community. Several strategies are in place to accommodate design flexibility. These include the physical structure of the hospital, which is composed of three zones (outpatient, inpatient and diagnostic/treatment services). The clinical services cross these zones in order to integrate physically all functions within a particular service. Furthermore, the hospital is built around generic wards, which almost any specialty could occupy. The majority of the wards have the same layout, with the exception of the pediatric and maternity wards. This facilitates the transfer between specialist divisions. Moreover, the building was designed to be internally adaptable and to accommodate further sizeable increases in bed numbers, ambulatory care and clinical support services. Strategically placed "soft spaces" should allow future internal and external expansion.

61. The Norfolk and Norwish PPP had considered and rejected several of the more obvious modular systems as were used in the Martini Hospital in the Netherlands, such as large panel exterior wall systems and partitioning systems that could be disassembled. Most of these were not deemed to deliver value for money over the lifespan of the building. The project did, however, benefit from the highly repetitive structural systems in the wards, which made construction more efficient. The new hospital was believed to be able to function even if there were a 20% reduction in the number of inpatients, by closing down parts of the hospital, scaling down maintenance services and renting out redundant areas.

Operational Phase

62. After commissioning the project, however, several changes have occurred within the hospital's environment. First, the demand for clinical services in the area grew faster than was planned. Second, at the beginning of 2004 the hospital became a university hospital, as a consequence of the opening of a new medical school, which meant that even more facilities would be needed at the hospital.

63. Despite the aspiration to have an adaptable design, flexibility has been limited in practice by the high occupancy rate of the hospital. The facility was designed for an 85% occupation rate, but in 2006 it was already running at over 90% occupancy. Since the hospital's opening in 2001, the need for clinical services has steadily grown. The steady increase in the demand for clinical services has required further adaptations and expansions that were not foreseen in the initial design. A recent expansion in the number of beds means that much of the designed overspill capacity has already been exhausted and that there is limited scope for further change.

64. According to the PPP, however, the hospital will grow rather than shrink in the future, as critical care demand is expected to increase. The utilities and their infrastructure are adaptable to meet this increase, but the agreed overcapacity has already been exceeded, and a variation of the contract is needed in order to implement such upgrades.

65. Value for Money in PFI-financed hospital projects in England has been interpreted in terms of their flexibility to accommodate changing demands for clinical services. However, as was witnessed in Norfolk and Norwich, the hospital concessions were based on conservative estimates of future clinical demand, which was necessary if they were to appear to be affordable. Overcrowded hospitals do not meet the health needs of a population; moreover they can contribute to the spread of disease.

66. The market testing mechanism is a useful tool to make adaptations to hospitals according to quality and benchmark standards; however, it should be stressed that mechanisms to allow for future changes should be incorporated into the initial design, in order to avoid the limitations felt by the Norfolk and Norwich PPP.

2.6 Certificate of Need Program in Maine, United States

67. Feasibility studies are essential for governments to evaluate and approve new capital investment projects. Maine's Certificate of Need (CON) program is an example of a possible solution to this.2

68. In 1974, the federal Health Planning Resources Development Act mandated that all 50 states evaluate certificates of need before allowing the continuation of any health capital investment projects, such as building expansions and ordering new high-technology devices. The goal was to restrain facility costs and allow for a more coordinated planning of health services and construction. Many states established CON programs in order to receive federal funding

69. Although the act was repealed in 1987, several states kept their CON programs. In order to decrease costs and provide more quality healthcare, the state of Maine passed a Certificate of Need Act in 2002 in attempt to decrease unnecessary construction and modification of health

2 This case study was adapted from Ashcroft (2011).

facilities and duplication of health services. The core principles of the Maine CON program are as follows:

- Supporting effective health planning
- Supporting the provision of quality health care in a manner that ensures access to cost-effective services
- Supporting reasonable choice in health care services while avoiding excessive duplication
- Ensuring that State funds are used prudently in the provision of health care services
- Ensuring public participation in the process of determining the array, distribution, quantity, quality, and cost of these health care services
- Improving the availability of health care services throughout the State
- Supporting the development and availability of health care services regardless of the consumer's ability to pay
- Seeking a balance, to the extent a balance exists, in achieving the purposes of the law, between competition and regulation in the provision of health care
- Promoting the development of primary and secondary preventive health services

70. The program is implemented through the Certificate of Need Unit (CONU), composed of a manager, 3 financial analysts and administrative support. To distribute the workload throughout the year, the CONU processes applications for different projects on a staggered timeline. In order for a project to be considered, a CON application must be submitted to the CONU. After receiving the application, a public informational meeting is scheduled and a public notice is issued. This part of the process is essential for the CON program's success. It allows for open feedback from the public regarding projects, allowing for citizens to express their needs and concerns. Any Maine citizen has the opportunity to provide a public testimony about a potential health capital investment project.

71. The CONU considers the public testimonies, along with input from organizations such as the Maine Quality Forum, the Maine Center for Disease Control (CDC), and the Bureau of Insurance. By consulting with the Maine CDC, the CONU is able to make informed decisions based upon population health needs. Throughout this process, there are several important factors considered in CON determinations:

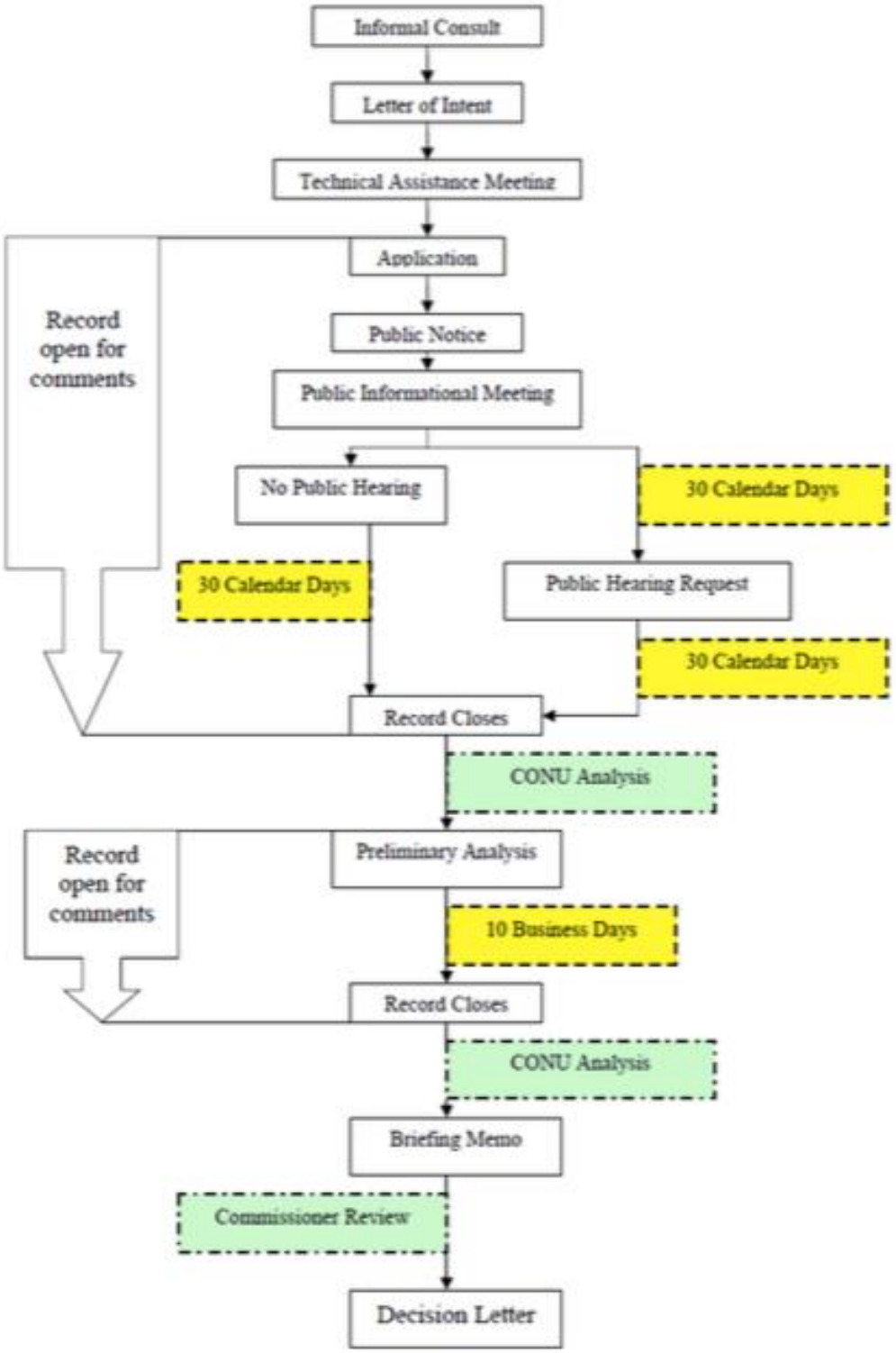
- The applicant is fit, willing and able to provide the proposed services at the proper standard of care
- The proposed services are economically feasible
- There is a public need for the proposed services
- The proposed services are consistent with the orderly and economic development of health facilities and health resources for the State
- The proposed services are consistent with the State Health Plan
- The proposed services ensure high-quality outcomes and do not negatively affect the quality of care delivered by existing service providers

- The proposed initiative does not result in inappropriate increases in service utilization
- The proposed project can be funded within the Capital Investment Fund (CIF)

72. Notably, the Maine CON program requires that applicants must prove their proposed capital investment is geared toward meeting some public need before a capital investment project can begin. Furthermore, for each application, the CONU solicits comments on the impact of each project on the health of Maine citizens from both the Maine Quality Forum and the Maine CDC.

    The following figure provides a detailed flowchart of Maine's CON program:

Figure 5 Flowchart of Certificate of Need Process



Source: Ashcroft, 2011

73. In contrast to the CIP process in Latvia, the CON program in Maine requires in-depth evidence of the potential worth of a capital investment project. Population health is considered to be of

crucial importance, and because of the CON process, no capital investment project can be approved without detailed consideration of population health needs from the applicant, the CDC, and the Maine Quality Forum. This thorough examination is less likely to favor larger hospitals in a disproportionate way, allowing for efficient CIP to occur at all levels of healthcare in order to best meet population health needs.

2.7 Capital investment planning using key drivers in British Colombia, Canada

74. Interior Health (IH), a publicly-funded healthcare provider in the Canadian province of British Colombia, was mandated by the 2001 Health Authorities Act to support health services in the province. IH adopted a capital investment strategy that focuses on improving population health using a population needs-based approach. Important lessons can be drawn from IH's capital investment strategy, which seeks to align with established planning principles and address three key drivers – demand for services, innovation and change, and sustainability – to achieve the most significant return on investment.

75. IH's capital investment strategy represents a shift from bed projections as a measure of health need, although it still relies on this form of measurement. The table below provides a high-level overview of the key drivers for capital investment and corresponding targets that IH works towards.

Table 3 IH Capital Strategy Drivers by Programs & Targets

Driver	Investment Area	Targets

Demand for Services	Acute Beds	- Utilization Targets
		  o Urban 475 days per 1,000 population
		  o Rural 525 days per 1,000 population
		  o Remote 575 days per 1,000 population
		- Less than 10% of alternative level of care days
		- Less than 95% occupancy rate (excluding newborns)

	Residential/Assisted Living Beds	- 93 beds per 1,000 population 75+ years of age - Greater than 60% of clients to first appropriate residential bed within 30 days
	Housing/Case Options	- Identify capital investments necessary to support housing/care options for specialized populations
	Surgical Service Capacity	- Reduce wait times / achieve provincial wait time targets/avoid provincial wait time penalties - Less than 10% of hip or knee patients waiting longer than 26 weeks. - 95% of hip fractures are completed within 48 hours. - Less than 10% of cataract surgeries waiting longer - than 16 weeks - % of non-emergency surgeries completed within - the benchmark wait time
	Emergency and Trauma Services	- Increase number of Canadian Triage and Acuity Scale (CTAS) 1, 2, 3 patients that get through the ED in less than 4 hours

		- Increase number of CTAS 4, 5 patients that get through the ED in less than 2 hours - If an ED patient is deemed to be admitted into the hospital, ensure they are admitted within 10 hours - Improve access and flow through redesign and implementation of infection control recommendations
	Intensive Care Services	- Identify capital investment requirements resulting from recommendations of the Critical Care Survey Analysis (October 2010).
Innovation and change	Evidence Based Practice and Building Standards	- Identify capital investment requirements to support evidence based practices - Achieve building standards as per the CSA Z8000- 11 for Canadian Health Care Facilities and British Colombia Building Codes - Achieve requirements for appropriate building requirements for residential/assisted living as per the Community Care and Assisted Living Act, Residential Care Regulations (2012)
	Community Integrated Health Services	- Integrate programs and information across multiple care settings - Identify opportunities to shift patients from acute setting to community - Identify opportunities to shift from inpatient to ambulatory care services - Identify co-location and consolidation opportunities for appropriate space and technologies
	Transportation of Patients and Information Within the Health Service Delivery Network	- Improve sustainability of rural health services - Improve access and flow - Implement advanced clinical systems functionality - Increase utilization of tele-health services
	Academic Capacity	- Identify and provide capital investments necessary to support academic spaces at targeted sites
	Land Transactions	- Land disposition and acquisition to align with service expansion needs
Sustainability	Technology and Equipment	- Invest in DI, surgical, MDR, lab, plant and support services to meet health service plans that provide benefit to outcomes and/or operations - Investment in change in technology that provides benefit to outcomes and/or operations
	FCI	- Address capital investment targets based on assessment of the physical condition of IH facilities
	Operational Efficiency	- Identify capital investments that reduce operating costs and increase productivity - Consolidate services in targeted areas to improve access, gain operational efficiencies and provide long term space solutions

Source: Interior Health 2013

76. Interior health uses these key drivers for long-term strategic planning (5-10 years), as well as tactical planning (3-5 years) and annual project planning. Moreover, key drivers and targets are used to rank capital requests. Thus, these planning principles serve as the basic tenets or rules around which service planning decisions are made. Using key drivers and targets such as these allow IH, as well other health districts that wish to model their service planning in this way, to transition away from solely using bed numbers to measure demand and capacity.

2.8 Disease-oriented Capital Investment Planning: An Example from Stroke Care

77. As in Latvia, strokes are a serious contribution to the burden of disease in OECD countries. Before discussing the resources needed to improve prevention and care of stroke patients, we discuss the two types of stroke: hemorrhagic and ischemic.

78. Ischemic strokes constitute the majority of the stroke case incidences, while hemorrhagic strokes account for approximately 20% of all stroke cases, with a mortality rate up to 50%. Hypertension is an important risk factor for these types of stroke. In Western Europe, it has been estimated that up to 30% of hemorrhagic strokes occur among hypertensive patients and could have been prevented with anti-hypertension treatment (Woo et al, 2004).

79. Most strokes are ischemic in nature and are caused by the development of platelet-fibrin thrombi (blood clots) and/or atherosclerotic plaques. This underlying mechanism shares important features with coronary artery disease and peripheral artery disease, highlighting the nature of athero-thrombosis as a risk for ischemia in brain and vascular beds. It is estimated that up to 80% of ischemic strokes can be prevented with currently available treatments for blood pressure, cholesterol, and antithrombotic therapy (Kirschner et al, 2005).

80. A study was conducted in the United States to estimate the risk of ischemic stroke and hemorrhagic stroke associated with uncontrolled blood pressure (defined as diastolic blood pressure >90 mm Hg or systolic blood pressure >140 mm Hg). The fraction of strokes attributable to uncontrolled blood pressure among treated hypertensive patients was calculated (Klungel et al, 2000). It was found that BP was uncontrolled in 78% of cases with ischemic stroke and uncontrolled in 85% of hemorrhagic stroke cases, compared with 65% of the control patients. After adjustment for potential confounders, uncontrolled blood pressure among treated hypertensive patients was moderately associated with ischemic stroke (risk ratio=1.5 [95% CI, 1.2 to 1. 9]) and strongly related to hemorrhagic stroke (risk ratio=3.0 [95% CI, 1.7 to 5.4]). This study found that nearly 30% of the ischemic stroke cases and nearly 60% of the hemorrhagic stroke cases among treated hypertensive patients were due to uncontrolled BP. Overall, more than 30% of all strokes were attributed to uncontrolled BP. Thus, the evidence suggests a considerable proportion of incident strokes among treated hypertensive patients may be prevented by achieving control of blood pressure.

81. Based upon this evidence, it can be suggested that stroke incidence in a population is positively correlated with the rate of unattended pre-existing risks, such as uncontrolled blood pressure Modifiable risk factors, such as hypertension, smoking and poor diet, can be alleviated by specific care and treatment, with the hopes of reducing the likelihood of a stroke (Goldstein et al, 2006).

Resource Planning for Stroke Care

82. The availability of treatment and prevention is a key fact to consider when estimating the actual volume of need for the number of beds necessary for stroke care. The answer to that question depends on whether or not at-risk patients are identified and treated against preventable risks. Understanding the degree to which the patients with major risk for stroke are identified, diagnosed, and started on treatment (for hypertension) is consequently a high-priority. This must be addressed before deciding upon how many stroke beds or CT scans are needed to diagnose and treat strokes for a given population.

83. Thus, before proposing the rational allocation and needed volume of resources, it is necessary to examine current case-load, hospitalization, and case-management patterns (including immediate acute phase care and referral) under current conditions in Latvia. The first step is to optimize use and utilization of available resources. Analysis of current patient flow and current compliance with evidence-based clinical protocols in procedures and equipment used in diagnosis, care, rehabilitation, and secondary prevention will provide information about options for optimization of currently available resources; furthermore, it will provide prompts for needed investments, reorganization and change of practice. For example, such an analysis will help approach the problem both by identification and intervention of at-risk patients and by improving early diagnosis and quality of care for patients with strokes.

84. The natural progression from hypertension to stroke should guide resource planning to improve stroke care. The following points are proposed for resource planning:

    i. Identification of number of undiagnosed hypertension cases in the population, age stratified, and gender divided (case-control study)

    ii. Identification of the number of undiagnosed atrial fibrillation cases in the population (case-control study)

    iii. Among patients with strokes, estimation of how many received treatment for hypertension or other risk factors before stroke occurred

    iv. Among patients with strokes, estimation of how many had a blood pressure reading registered before stroke occurred.

    v. A mapping of where the stroke cases are managed and the time-frame between stroke to diagnosis and active care

    vi. An assessment if primary care and ambulance staff recognize basic symptoms and signs of stroke (Romberg's test, etc.)

    vii. A mapping of presence of equipment as listed and utilization, as identified from evidence-based diagnosis and treatment guidelines

    viii. Based on case reviews, a situation review of present resources available and analysis of current diagnostic and treatment practice.

    ix. Development of service level allocation for pre-stroke risk case identification and care

    x. Development of service level allocation for stroke diagnosis, care and rehabilitation

    xi. Development of investment plans and hospital and pre-hospital service reorganization to align services with best practice for stroke prevention and for stroke care.

Gaps-analysis

85. Before planning can be made for improved stroke care on a regional level, it is necessary to conduct a mapping of existing gaps. All gaps-analyses must be done through systematic analyses of representative sample of patient case data, illustrating true current case-management and case-flow, compared with procedures as recommended in evidence-based clinical practice guidelines and protocols. Based on results from the gaps-analysis and resource utilization mapping, a strategy can be made for effective stroke care improvements within existing resources and with investment-needs identified from the gaps-analysis

86. The gaps-mapping should start with mapping primary prevention for pre-stroke treatment and risk factors. Results from this work will be used for planning improved case-identification and primary prevention for at-risk patients. This mapping should specifically target the risks of hypertension, arrhythmia, and related stroke prevention through improved primary prevention routines.

87. Gaps-mapping needs to address gaps between what is defined in evidence-based medicine protocols and the existing resources/equipment and HR skills for management of actual stroke cases. This should map gaps on several different levels: 1) pre-hospital, 2) hospital admission, 3) acute care level for stroke management, 4) immediate acute, and 5) rehabilitation.

88. Based on gaps-mapping, priorities will be identified for stepwise capital investments and for investments in HR competence building for improved stroke diagnosis, care, and treatment. The mapping includes a mapping of resources in relation to hospital level of complexity and degree of needed complexity in diagnostic and therapeutic procedures, aligning with a rational service level configuration.

The two-way approach

89. Lane A: In addition to assessment of diagnosis and care of acute stroke, it is essential that primary care diagnosis and long-term treatment of at-risk patients are analyzed. Current practices also need to be compared against evidence-based guidelines for stroke diagnosis and care. This analysis should cover patients with hypertension, arrhythmias, diabetes, and other metabolic risk factors. The logic behind this approach is that improved primary risk case identification allows for enrolment in evidence-based risk-management, effectively reducing the incidence of stroke.

90. Lane B: Treating patients with acute stroke requires intensive care to reduce case mortality. The design of intensive care support depends on availability of diagnostic resources and availability of staff with high levels of skill, maintained through a relevant case-load. Where CT scan is available, it may be appropriate to adapt to international praxis with thrombolysis in ischemic stroke cases. Key components for improved stroke care also include review of available equipment for mechanical ventilation and continuous ECG and pulse oxymetry.

The rationale for resource mapping

91. Examples of intensive-phase acute stroke care for patients with moderate to severe acute stroke scores should be diagnosed and then monitored with the use of proper equipment, ensuring appropriate interpretations as the basis of correct actions. Consequently, stroke patients need

to be referred and resources concentrated to centers with sufficient case-load to maintain staff skills and competence in use of:

- CT scan
- Continuous ECG for 2-3 days
- Laboratory tests, such as for D-dimers, APTT, etc.
- Oxygen saturation
- Safe management of blood pressure
- Safe management of temperature control during the first 24 hours
- Safe management of blood glucose levels, intermittently but frequently

Care for the patient with stroke also depends upon the availability of special “stroke-beds” to enable elevation of head and upper body and resources for mild hyperventilation for patients with cerebral edema.

92. Highly skilled hospital staff are also essential to avoid errors, such as aggressively treating hypertension in a patient with an acute stroke. This is a common error in many healthcare systems – it further aggravates the stroke risk. It has been proven that hypertension should not be routinely treated in the acute phase of a stroke. Such awareness rests on the basis of qualified staff and the constant improvement of their skills and competence through management of relevant case-loads and training. Stroke cases should not be disseminated everywhere, but rather allocated to achieve a concentration of resources and skills. Advancements in health information technology such as telemedicine make such concentration possible.
93. Concentrating necessary equipment will also be required to treat cases appropriately. Prophylaxis against the risk for developing complications with a deep vein thrombosis and pulmonary embolism, for example, are priority objectives in the care of all acute phase stroke patients. For this, adequate laboratory diagnosis, such as for D-dimers, is needed; thus, it is recommended that stroke cases be treated in high-level hospitals with access to advanced diagnostic laboratory resources.
94. Recent decades have also seen the introduction of thrombolysis, but anticoagulant drugs and thrombolytic must, of course, be avoided in patients with hemorrhagic stroke. The differentiation between hemorrhagic and ischemic stroke is therefore a high priority early in the case management, which is a strong argument for concentrating patient-referrals to hospitals with CT scan 24-hour capacity.
95. The ability to monitor effects of Heparin by measuring blood APTT is also a priority for good care of a stroke patient, yet another example of why a stroke patient needs to be referred to a hospital with adequate laboratory resources.
96. Analysis of patient cases and patient records from stroke cases is therefore necessary to identify and find targets for improvement of diagnosis and care of the stroke cases. All of these efforts can be made in Latvia.

Principles healthcare planning for acute stroke care in the OECD

97. Among OECD countries, there is a high degree of consensus regarding the application of evidence-based medicine as the basis for healthcare planning. This means that a continuous process of clinical research and systematic approach of evaluating research leads to reassessment of practical healthcare delivery. These methods and procedures give best and safest outcomes and results within the available budget frame in regard to medicines, healthcare system configuration, and patient flow models. The application of evidence-based medicine jointly with health economics assessment is often referred to as medical technology assessment (MTA).

98. This process is illustrated in the example of the development of stroke care throughout the past few years. Current evidence-based best practice in acute stroke care defines the role of primary care in identifying risks for primary prevention and for secondary prevention to reduce risk for recurrent stroke. It also gives significant attention to essential methods in diagnosis and treatment for delivery of care during the acute phase - in particular, to rapid access to essential diagnostic procedures and equipment and rapid referral to meet the need for thrombolysis for eligible patients with ischemic stroke. Specifically, an important target for health system planning and investment is to achieve this set of essential services within a defined 4.5-hour time window from onset of stroke.

99. With agreement across OECD countries requirements, standards for the health system tend to be similar in content, but with some differences in approach. For example, for health systems serving geographically dispersed populations, access requirements or maximum distance to the nearest acute stroke unit may be emphasized. Health systems making an explicit attempt to improve the quality of stroke care and process standards are more likely to cover more steps in an acute care pathway. In more health systems with greater resources, focus may be on accreditation of units delivering sufficient volumes of stroke-service activities (case volumes served) to justify stroke-specialist status. Almost all regions have detailed audits of stroke services used as a basis for planning improvements, investments, and changes in the organization of the health system to match evidence-based protocol guideline requirements.

100. While there is wide consensus on the components and procedures of required care, different health systems have developed different models of provision. Health systems with a larger average hospital size, for example Netherlands and Sweden, offer acute stroke care on-site at most acute hospitals using their own imaging facilities and staff. In contrast, in a health system serving a more dispersed population such as in Ontario, Canada, acute stroke care is organized as a network with designated centers providing care with a small number of additional sites providing thrombolysis supported by telemedicine specialist assistance. In the example of Arkansas, USA, stroke care is also organized as a network; however, in this case a small number of hub sites provide tele-stroke support to a very large number of smaller sites. In the case of Australia, the health system now requires greater centralization of acute stroke services. Currently, a larger number of sites offer acute stroke care but are considered to be sub-scale, where too few cases served per center prevent these units from maintaining the needed level of skills required for quality stroke care. Germany has a system of levels of stroke care for hospitals, and many countries operate systems of such “tiered” or graded acute stroke services.

101. Following the modern principles of evidence-based medicine clinical protocols and guidelines, many OECD countries have formally designated comprehensive specialist stroke units. These

are usually planned and resourced to serve catchment populations around 1 million. After the acute phase care (2-3 weeks) many health systems, including those in Arkansas, Ontario, Netherlands and Germany operate a network of centers for post-acute stroke rehabilitation. These are sometimes co-located with acute hospital services but often operate as entirely separate, specialist units.

2.9 Summary and lessons for Latvia

102. The cases explored in this section demonstrate various approaches to achieving service-based capital planning. Several lessons learned may be drawn to assist Latvia in making this transition.

103. All of the studies demonstrate the importance of planning according to population health needs, yet most capital investments continue to be driven by infrastructure. The major challenges to OECD countries when it comes to capital investment for health – the demographic and epidemiological transitions associated with an ageing population, advances in medical technologies and pharmaceuticals, rising public expectations, persistent health inequalities, and upward pressure on health expenditure – are also faced by Latvia.

104. The case studies provide a myriad of strategies to overcome these challenges:

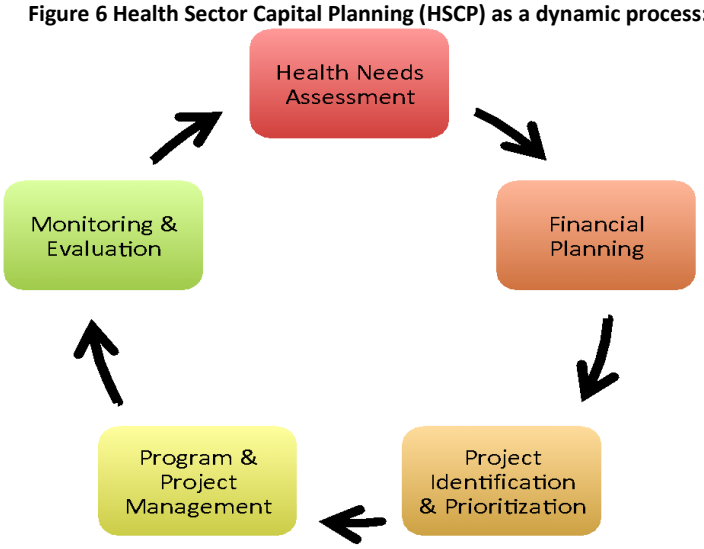
- The Martini Teaching Hospital, Netherlands – flexible design and future-proofing to allow for adaptation of buildings according to population need;
- Northern Ireland – integrated health and social services as a way to enhance primary care services in the community and concentrate complex services;
- The Alzira Model, Spain – involving the private sector and implementing capitation payment to ensure efficient responses to population need;
- Coxa Hospital, Finland – creating an independent company that meets public health needs and takes advantage of market developments;
- Private Finance Initiative, England – a cautionary tale regarding conservative estimates of future need;
- Certificate of Need, United States – a unique stoplight approach to assessing feasibility and need;
- Interior Health, Canada – transitioning away from bed numbers as a measurement of service need to key drivers and targets;
- Disease-oriented capital investment – in-depth resource planning and gaps analysis to adapt service delivery to need with respect to stroke, and potentially to have an impact on abating the disease.

105. The following section provides a rapid assessment of the current status of Latvian capital investment planning by applying a maturity model approach to the identification of the key components of a service led, capital investment planning process.

3. An assessment of Latvia's current capital investment planning model

106. Designing and implementing a new Capital Investment Planning (CIP) model for Latvia will require the development of new strategies and tools to make investments respond to a needs-based and rational capital allocation strategy. A reformed CIP would follow a process flow similar to that outlined in the following figure. It starts with a health needs assessment that takes into account the population's health needs and availability of supply to meet those needs, followed by detailed financial planning, project identification and prioritization, project management, and evaluation. This complete cycle should be in place to ensure value-for-money with public investments.

Figure 6 Health Sector Capital Planning (HSCP) as a dynamic process:



Source: Sanigest Internacional

107. The case studies from the OECD from the previous chapter and the need for a service-based planning model has been developed into an excel sheet to assess practices in Latvia compared to international standards. The full list of practices is included in Annex 1. Performance with respect to these practices was then used to assess the current capital investment planning function with a maturity model approach, in which key components are ranked according to their position on a five point scale. The five point scale corresponds to the five levels traditionally evaluated in maturity models (summarized in Figure 7 and Table 4): (1) basic awareness but limited application; (2) basic aspects required are sometimes considered; (3) the key processes are defined but not always followed; (4) processes are followed and nearly complete; and (5) most key elements are considered and optimized during execution.

Figure 7 Capital investment Planning Assessment levels

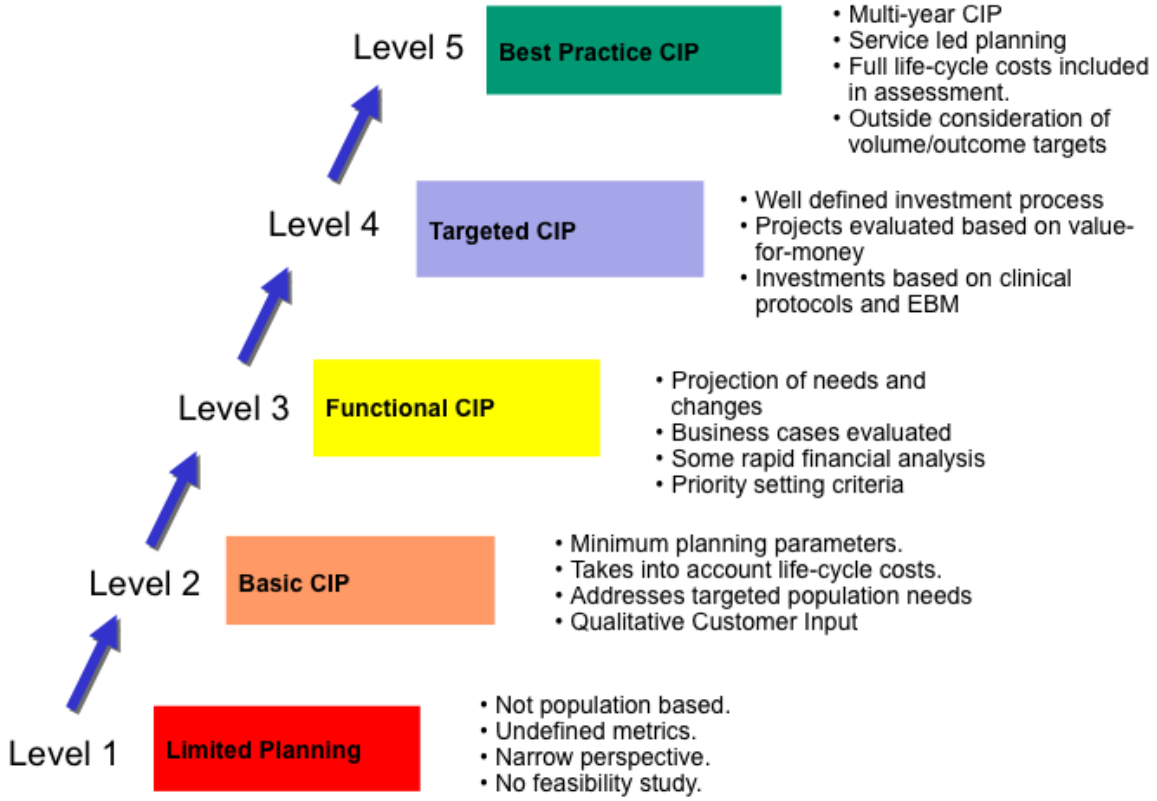


Table 4 Assessing maturity of the capital investment planning

Domain	Level 1	Level 2	Level 3	Level 4	Level 5
Governance and Policy	No clear link between health policy goals and mandate to use needs based approach	Limited indication that population needs and health policy are aligned	Clear link between priority health policy objectives and investment priorities	Evidence of consistent consideration of health impact and investments	Demonstrated commitment to ensuring direct relationship to health policy, setting priorities and reporting results transparently
Health Needs Assessment	Very limited identification of health	Limited indication that	Clear link between priority	Evidence of consistent consideratio	Demonstrated commitment

	needs based investment planning	population needs and service output contribute to investment planning	health needs and investment priorities	n of health needs and investments	to making investment based on health needs and measurement of ROI
Financial Management	No clear process followed to budget and evaluate investments.	Limited processes in place for investment budgeting and financial management	Basic processes in place to plan, evaluate and manage financial investments	Evidence of consistent levels of financial management for CIP projects	Demonstrated commitment to highest levels of transparency and objective decision-making in capital investment projects
Project Identification	No clear criteria for evaluating investments, no feasibility studies carried out	Limited availability of standardized process for transparent decisions on investment priorities	Investment decisions almost always follow clear criteria and have minimum level of ROI evaluation	Evidence of consistent application of investment rules and advanced ROI techniques	Demonstrated commitment to ensuring proper value-for-money evaluation of al investment decisions
Project Management	No established policy outlining the PM approach for investment projects	Limited application of PM tools and approaches	Sporadic application of PM approaches and tools. No standardized reporting or guidelines	Evidence of consistent application of PM tools and published guidelines	Demonstrated commitment to applying PM tools to all investment projects and following established standards

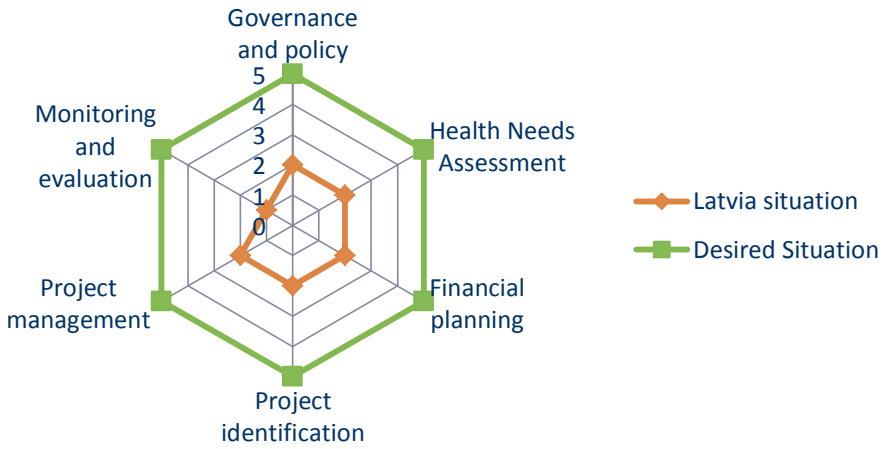
M&E	No M&E approach is defined for CIP	Limited evidence that M&E system is in place for projects under execution.	Guidelines established for M&E and milestones established for most investment projects	Evidence of consistent use of M&E guidelines and reporting on project progress.	Demonstrated commitment to use of the M&E system, transparent reporting and evidence of feedback loop.

108. In each of these domains, a series of evaluation criteria were assessed to determine the existing level of maturity in the Latvian capital investment planning model. This follows a standard approach to evaluating capacity in organizations, with increasing levels of complexity in the process reflected in a higher level evaluation. The assessment was done through a series of interviews in Riga in September 2015, review of documents, and site visits.

109. It is important to note that the ratings are the views of the authors. The questions in Annex 1 and the criteria in Table 4 can also be used by the Ministry of Health and National Health Service to conduct its own self-assessment, as these are processes and activities followed by mature health systems when planning capital investments.

110. The following figure highlights the gap analysis between the current situation and the desired situation. This rapid assessment is based on the evaluation of each of the areas assessed and the specific metrics that should be included in each. Latvia falls somewhere between Level 1 and Level 2 with only basic procedures in place to identify investment projects, to evaluate these projects and to monitor and evaluate them. Significant opportunities exist to improve the process.

Figure 8 Gap Analysis in Latvia CIP



111. The gap analysis radar graph above shows the assessed performance in each of the key domains. Overall, the maturity rating is 1.88 out of 5 as the perfect score, or a level which could be considered as a nascent CIP system given the general lack of standards, linkage with service planning, and needs assessment, not to mention the general need for increased transparency regarding investment decision-making criteria. The lowest performance is in the domain of M&E where there appear to be few processes in place for a robust monitoring and evaluation framework and no linkage between investments and improvements in health system objectives, such as health outcomes, financial protection, or responsiveness. Slightly higher marks are awarded for project management and financial planning since at least EU procedures are followed which provide with some of the framework elements that are required for a comprehensive CIP system.

112. Below is a summary of the key issues in each domain based on the assessment.

Table 5 Summary of assessment results

Domain	Key issues
Governance and Policy	In the past, there has not been a direct link between health needs, desired changes in outcomes, and investment planning. No clear policy outlining the relationship between CIP and key service, health output targets
Health Needs Assessment	Current CIP does not adequately consider the actual health needs by district and key indicators such as unmet need, financial access and access to key inputs that could affect health outcomes

Financial Management	Key aspects such as business cases, feasibility studies, evaluation of ROI and detailed financial planning are not sufficiently covered in the current CIP
Project Identification	There are no adequate mechanism in place to prioritise investment and make trade off questions between investment
Project Management	Limited project management processes have been developed.
M&E	Project M&E is limited and few instrument exist to track the impact of investment and feedback into future investment decisions.

4. Conclusion

113. The assessment in this report of the capital investment planning process in Latvia rated it as relatively immature. That the Ministry of Health cannot conduct the analyses required for infrastructure maps and master planning on its own and that it does not have up-to-date access to information related to major medical equipment and refurbishment for state-owned hospitals suggests significant room for improvement.

114. The cases studies presented in the report offer some solutions to improve planning that could be feasible for Latvia, such as future-proofing future construction or certificates of need for new investment projects. The methods outlined in another deliverable – the Master Plan – provide a basis for determining health needs and the gaps and surpluses in human resources, equipment, and infrastructure, and the Ministry of Health and National Health Service could use a similar approach in future planning. Other recommendations repeated in multiple other deliverables associated with the World Bank's advisory services highlight the need for complementary reforms that would further aid the investment planning process, such as the development of clinical guidelines and clinical pathways and a strengthened health management information system. In the future, the medical needs of the population would drive investment, and the Ministry of Health would have sufficient information from both patients and health care providers to determine which investments would generate the most value-for-money in Latvia.

Annex 1: Assessment questions

Domain	Questions	Current Situation (1=basic awareness, 2=often followed, 3=key to defined process, 4=normal practice, 5 = optimized)	Desired Situation is always 5
Governance and policy	Infrastructure projects developed in line with strategic health objectives?	1	5
	Level of influence that health policy objectives have on capital investment decisions?	2	5
Overall		3	10
Health Needs Assessment	Population healthcare needs are basis of capital planning	1	5
	Population's needs defined as combination of: (1=beds per population size, 2=Service output (current and projected), 3=Health issues (current and projected), 0=not clearly defined)	1	5
	Are these direct measures or proxy estimates are used to measure healthcare need? (1=bed days, 2=hospitalisations, 3=existing service levels, 4=rates of service utilization, 5=disease prevalence/incidence, 6=population projections)	2	5
	Case-mix affects the benchmarks and norms for the capex decision-process?	1	5
	PHC needs are considered separately as part of the capital investment planning process?	1	5
	Existing infrastructure conditions are considered as part of the planning process?	1	5
	Information is readily available to estimate needs for maintenance/refurb separately from new investment?	1	5
	Population projections are made for at least 10 years to consider long term demographic changes in the CIP?	1	5
	Demand forecasting for at least 10 years is part of the CIP process?	1	5
	Clinical pathways, or protocols, are part of the projection for CIP in the future?	1	5
Overall		11	50
Financial planning	There is a formal capital investment planning process documented?	1	5

	Capital budgets are allocated between new investment and refurbishment?	2	5
	There is a capital budget established that links population needs to resources allocated?	1	5
	There is a multi-year capital budget?	4	5
	Standardized parameters are used in formulating budgets, e.g. cost per m2 construction?	1	5
	Feasibility studies consider the life-cycle costs of the facility?	1	5
	Feasibility studies consider the future revenue or allocation of funds to each facility as part of the return on investment?	1	5
	All levels of government are involved in the CIP process	1	5
	The capital planning process includes some measure of ROI, e.g. payback, npv, dcf, etc.	1	5
Overall		13	45
Project identification	Capital investment projects always initiate with a business case?	1	5
	Feasibility studies are done for all major investments including consideration of ROI ?	1	5
	Projects are evaluated based on gap analysis between needs and existing resources?	1	5
	There are approved guidelines on new investment project planning?	1	5
	Specific criteria exist to evaluate competing investments?	2	5
	Investment decision criteria are publicly available?	1	5
	Investment decisions in terms of priority projects are made available to the public in a transparent process?	1	5
	Value-for-money is considered as part of the project evaluation process?	1	5
	Risk stratification of projects is practiced?	1	5
Overall		10	45
	A project management approach, e.g. PMI, is followed for each investment project?	1	5
Project Management	Details are established regarding communication between key actors with status update sessions?	2	5
	There is a clearly defined process to oversee the control of quality and execution according to standards pre-established	2	5
	There is clear accountability assigned to an individual or team for the execution of the investment project	2	5

	Penalties are established for non-compliance with timelines or deliverables?	1	5
Overall		8	25
Monitoring and evaluation	Clear milestones are established for M&E of capital investment projects	1	5
	At least quarterly reports are prepared outlining progress on each investment	1	5
	There is an IT system to support M&E?	1	5
	M&E reports are discussed with key stakeholders?	1	5
	There is a feedback loop so that M&E results feed back into future capital planning processes?	1	5
Overall		5	25

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