What does it take to make integrated care work?

A 'cookbook' for large-scale deployment of coordinated care and telehealth to deliver patient benefits in your organisation
The work leading to these results has received funding from the European Community's Health Programme under grant agreement n° 20121209. The ACT programme is fully aligned with the European Innovation Partnership in Active and Healthy Aging objectives to deploy integrated care for chronically ill patients.

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“People increasingly want healthcare on their own terms, in places and at times that let them get on with their daily lives.”

Bas Verhoef, President Market Group EMEA, Philips Healthcare
Executive summary

ACT Consortium

The Advancing Care Coordination & Telehealth Deployment (ACT) Programme is the first to explore the organisational and structural processes needed to successfully implement care coordination and telehealth (CC&TH) services on a large scale.

This EU-funded programme includes a consortium of healthcare authorities, clinical experts, universities and industry partners. After monitoring CC&TH initiatives in five EU healthcare regions – Lombardy (IT), Basque Country (ES), Catalonia (ES), Northern Netherlands (NL), and Scotland (UK) – the ACT programme has produced this ‘cookbook’ of good practices to facilitate CC&TH deployment across Europe.

Challenges

The challenge now is to deliver on the promise of better patient experience, better population health, and more efficient use of resources. The observations of the ACT programme, on care integration in the five regions, tells us that not all of the aims will be easy to achieve. The challenge will be in overcoming these barriers, and creating new models, and ways of thinking, around integrated care.

Encouraging Signs

In evaluating the good practices mentioned in this cookbook, however, we can see signs of encouragement. The opportunity to implement integrated care at a far greater scale is likely to evolve with a stronger, more enabling and supportive environment.

For this purpose, the consortium has developed a full data collection strategy to assess the current state of CC&TH deployment in the five regions, and monitor progress and changes.

ACT Outcomes and Drivers

ACT collects data to evaluate CC&TH deployment outcomes. Here we assess efficiency and efficacy. Ensuring a level of quality for higher demands with limited resources — due to the demographic changes and exploitation of chronic diseases.

Together with the outcomes, we address the successful drivers of CC&TH in the following areas:

Risk stratification: We look at how healthcare providers have identified the sub-populations in different levels of risks. Then we assigned resources to fill their care needs at a regional level.

Workflow and organisation optimisation: Here we look at the challenges of managing a health care delivery organisation in the face of increased expectations and constrained resources. And how healthcare organisations can optimize structural changes, care pathways, and care coordination.

Staff engagement: We observe what organisations are doing to motivate, train and prepare professionals for this new model of working.

Patient adherence: We discuss the promotion of self-managed care, identify its complications and benefits, and review how patients define the new role.

ACT Evaluation Framework

ACT uses a holistic framework for evaluating the scaled deployment of CC&TH. Its success relies on the analysis of drivers and outcomes, which address the qualitative and quantitative aspects of the deployments.

• The Key Performance Indicators are the quantitative outcome indicators that capture CC&TH performance.
• The Key Drivers are the qualitative indicators, which describe anything that affects CC&TH performance.

This holistic framework is what drives the ACT evaluation engine.

ACT Evaluation Engine

The ACT evaluation engine is a useful tool for data collection, storage, and analysis of CC&TH data. Developed by Philips Research and the University of Thessaloniki, it utilises a number of open source tools, and custom-developed modules. It enables centralised data collection, an on-line survey tool, and interactive dashboard for data analysis and visualisation of key indicators. The platform is secure, flexible, and user-friendly.

www.act-programme.eu

The work leading to these results has received funding from the European Community’s Health Programme under grant agreement n° 20121209.

The ACT programme is fully aligned with the European Innovation Partnership in Active and Healthy Ageing objectives to deploy integrated care for chronically ill patients.
Insights and Conclusions
A number of insights and conclusions were identified by the ACT programme. These will prove useful and valuable for informing the large-scale deployment of CC&TH. Targeted at populations of chronic patients and elderly people, these insights and conclusions are a useful benchmark for implementing and exchanging best practices across the EU.

- Perceptions between managers, frontline staff and patients do not always match.
- Organisational structure does influence the views and experiences of patients.
- Successful patient adherence happens when staff are engaged.
- There is a willingness by patients to participate in healthcare programmes.
- Patients overestimate their level of knowledge and adherence behaviour.
- The ability to track the use of resources is a useful feature of a stratification strategy, however, current regional case finding tools are difficult to benchmark and evaluate.
- Data availability and homogeneity are the biggest challenges when evaluating the performance of the programmes.

ACT Recommendation Highlights

Staff Engagement
Findings from ACT suggest that no single intervention can ensure staff engagement. Yet it is clear that frontline staff should give a clear insight into the potential benefits of the programme. What have demonstrated to be effective are interventions in training, early engagement of staff, introducing feedback loops, and ensuring recognition of professional expertise.

Patient Adherence
Healthcare systems, programmes, personalities, and importantly – patient profiles vary substantially. For this reason, we need to design adherence strategies that are adapted around the needs of the patient. Not only clinical, but also social support and socio-economic needs.

Stratification
Health risk assessment should employ a population-based approach. Both for risk prediction modelling and indicators. This is a priority for the scale up of integrated care at an EU level.

Assessment
European regions should agree on a minimum dataset of outcome indicators to be collected by all CC&TH programmes, addressing data collection challenges (comparability, ambiguity), with a small set of strictly defined indicators. The EC should facilitate unified data collection through interfaces, conforming to data privacy and protection legislation, and promote further initiatives in the implementation of evaluation of integrated care programmes.

Regional Good Practice Examples

Basque Country: Population Intervention Programmes
Regional risk stratification strategies indicate how to match populations, and individual requirements, to appropriate service levels.

Lombardy: CREG Programme
Personalized care plans improve patient satisfaction and perception of safety, as well as their capacity to manage their condition.

Catalan Agency for Quality in Healthcare
There is a need for proper KPI systems (data + IT system) and a mandate to review the progress of interventions, guide decision-making, and identify areas that need management attention and resources.

Northern Netherlands: Embrace
A novel, population-based, integrated care model for the elderly community, aimed at helping them live at home as long as possible. With comfort and independence. This programme demonstrates an ongoing approach to encouraging and acting upon frontline staff feedback to promote staff engagement.

Scotland: REACT programme
A community service for the frail and elderly, which supports their desire to remain at home. Avoiding the need for unplanned emergency admissions.
Consortium

**ACT Consortium**
The Advancing Care Coordination & Telehealth Deployment (ACT) Programme brings together a Pan-European consortium of leading companies, universities, hospitals and healthcare authorities. Initiated in February 2013, the 2.5-year programme defined good practices in care coordination and telehealth. The objective of this EU co-funded project is to overcome the structural and AI barriers surrounding the deployment of coordinated care.
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“Patients overestimate their level of knowledge and adherence behaviour. They are often unaware of the impact of their own behaviour on their health.”
Preface

**Primary challenge**
Quality of life for patients who are chronically ill is a primary challenge for healthcare systems in EU member states. They are faced with a population that is rapidly ageing. Plus, the related burden of chronic illness growing to pandemic proportions. In the EU, some 10 million people suffer from heart failure, 20 million have chronic obstructive pulmonary disease (COPD), and 60 million live with diabetes. These three conditions cost EU healthcare systems around EUR 125 billion each year.

**Care coordination and telehealth services**
Chronically ill people can now be treated in their own homes. One of the most effective ways to manage these patients is through the deployment of integrated care. Care coordination and telehealth services (CC&TH) provide patients with independence, freedom, and control over their health and lifestyle. Using remote management systems, and an integrated network of caregivers, patients can help themselves. Resulting in measurably improved health.

**Promising results**
Clinical studies around CC&TH are promising. These integrated systems can reduce the economic burden of chronic care, and maximise delivery of clinical support. Positive benefits of CC&TH are linked to how well organisational change is implemented. CC&TH has the potential to reduce hospital admissions, days in hospital and mortality rates. Despite the shortage of skilled professionals within European healthcare systems.

**Barriers to deployment**
CC&TH has been limited to pilot programmes and test installations. This is due to the complexity of translating evidence into practice. Deployment on a wider scale can only be achieved with new behaviours, routines and ways of working. Which require significant organisational change. So far, this has been directed at improving health outcomes, administrative efficiency and cost effectiveness. With a more proactive experience for patients and health professionals.
The Advancing Care Coordination and TeleHealth Deployment Programme (ACT) is the first of its kind. It is specifically designed to help overcome the barriers surrounding the large scale deployment of care coordination and telehealth services (CC&TH).

Foundation to overcome barriers
The ACT programme brings together a powerful Pan-European consortium. Which includes healthcare authorities, clinical experts, universities and industry partners. In full support of the ACT programme, their efforts are directed at greater health outcomes for the chronically ill.

Beyond the trial setting
With the objective of identifying good practices, the ACT programme goes beyond the trial setting to assess the structural and organisational drivers, and their barriers, in five EU healthcare regions: Lombardy (IT), Basque Country (ES), Catalonia (ES), Northern Netherlands (NL), and Scotland (UK). Each participating region manages, via integrated care programmes, a group of at least 3,000 heart failure, COPD, diabetes, and comorbid patients.

Large-scale deployment of CC&TH
This ‘cookbook’ of good practices identifies best-in-class processes, structures and ways of working from these five partner European regions. Their insights, conclusions and recommendations, presented here, can be used to build a blueprint for large-scale CC&TH deployment.

Evaluation of CC&TH deployments
In order to transfer the advantages of CC&TH services into routine clinical practice, it is essential to understand how to measure CC&TH service performance over time. It is also important to understand how the performance is driven, so that large-scale deployment can be guided by the configuration of these outcomes.

The ACT programme gathers regional data by using an Evaluation Framework and Evaluation Engine to help investigate three core questions:

1. How do CC&TH services work around Europe?
2. What needs to be done to make them work better?
3. How to deploy high-quality CC&TH services in new European regions?

Evaluation Framework
The Evaluation Framework refers to a holistic approach for assessing qualitative and quantitative (effectiveness and efficiency) performance of CC&TH services deployed in a local healthcare system. The framework of measurement indicators is structured in domains and subdomains over several areas, as presented in Figure 1.
### Data collection

The duration of the project was 32 months, starting in February 2013. Baseline data was collected in month six to report how CC&TH pathways are integrated and accepted in the regions. The figure below summarises the data collection: The baseline describes data collected from programme managers, frontline staff, patient adherence, and staff engagement. It also provides an overview of the status quo of the region at the start of the project. Iteration data was collected in months 14, 18 and 26. During the iteration phase, specific data was collected and evaluated 2012, 2013 and 2014.

#### Data

<table>
<thead>
<tr>
<th>Data</th>
<th>Description</th>
<th>Collection method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td>Month 6 (July 2013)</td>
<td></td>
</tr>
<tr>
<td>Care coordination &amp; workflow</td>
<td>Extensive survey (programme manager) on qualitative aspects of care coordination and workflow.</td>
<td>Survey (Closed and open questions)</td>
</tr>
<tr>
<td>Staff engagement</td>
<td>Survey (programme manager) on staff engagement.</td>
<td>Survey (Closed and open questions)</td>
</tr>
<tr>
<td>Healthcare system description</td>
<td>Description of the context of the healthcare system in which CC&amp;TH is deployed.</td>
<td>Written documentation</td>
</tr>
<tr>
<td>Population description</td>
<td>Description of the population characteristics.</td>
<td>Written documentation</td>
</tr>
<tr>
<td><strong>Iteration 1</strong></td>
<td>Month 14 (March 2014)</td>
<td></td>
</tr>
<tr>
<td>Population stratification</td>
<td>Data collection from healthcare systems and reported domain knowledge on population stratification. Data from 2012.</td>
<td>Spreadsheet</td>
</tr>
<tr>
<td>Efficiency and efficacy</td>
<td>Data collection from healthcare systems. Data from 2012.</td>
<td>Spreadsheet</td>
</tr>
<tr>
<td>EIP on AHA B3</td>
<td>Survey (programme managers) to collect information on key features of risk stratification models.</td>
<td>EIP on AHA B3 survey results</td>
</tr>
<tr>
<td><strong>Iteration 2</strong></td>
<td>Month 18 (July 2014)</td>
<td></td>
</tr>
<tr>
<td>Programme manager</td>
<td>Follow-up survey (programme manager) of the care coordination and workflow survey. The programme manager’s views about the CC&amp;TH programme to identify the best ways to support the effective implementation of CC&amp;TH services in the routine management of people with chronic diseases.</td>
<td>Survey (5pt-Likert closed and open)</td>
</tr>
<tr>
<td>Frontline staff</td>
<td>Follow-up survey (frontline staff) of the staff engagement survey. Frontline clinician views about the CC&amp;TH programme to identify the best ways to support the effective implementation of CC&amp;TH services in the routine management of people with chronic diseases.</td>
<td>Survey (5pt-Likert closed and open)</td>
</tr>
<tr>
<td>Patient adherence - Part 1</td>
<td>Patient adherence survey (patients). The patient views about the programme.</td>
<td>Survey</td>
</tr>
<tr>
<td><strong>Iteration 3</strong></td>
<td>Planned: Month 24 (January 2015)</td>
<td></td>
</tr>
<tr>
<td>Population stratification 2013</td>
<td>Follow-up with 2013 and 2014 data.</td>
<td>Data collection template</td>
</tr>
<tr>
<td>Efficiency &amp; efficacy 2013</td>
<td>Follow-up with 2013 and 2014 data.</td>
<td>Data collection template</td>
</tr>
<tr>
<td>Patient adherence – Part 2</td>
<td>Follow-up of patient adherence survey.</td>
<td>Survey (5pt-Likert closed and open)</td>
</tr>
<tr>
<td>Patient adherence</td>
<td>Structured group interviews.</td>
<td>Structured group interviews</td>
</tr>
</tbody>
</table>

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The ACT Programme
**Evaluation Engine**

The ACT evaluation engine is responsible for capturing, monitoring and evaluating CC&TH deployment, using collected data. This web platform is able to publish, manage, and analyse on-line surveys, collect quantitative indicators via on-line and off-line templates, visualise stored information in multiple views and export data for further statistical analysis. The data is organised as key drivers (generic aspects of healthcare programmes determining their quality with respect to CC&TH) and key indicators (measurable healthcare outcomes used for assessing the drivers). These drivers and outcomes are important considerations when deploying CC&TH at scale.

Figure 3 presents the elements and context of the evaluation engine. The engine has been built on open source technology to offer a content management system with a database. It offers surveys, statistical analysis and interactive visualisations. The analysis performed by the domain experts has been added in the evaluation engine, and runs on the collected data.

**The engine supports:**

- A central point of authorised data entry and navigation in the system.
- An online survey tool, with questionnaires for different users, regions, and groups of indicators.
- Import modules for survey data from the survey tool, and external sources.
- An import module for quantitative data templates.
- A data model, which supports integration of data originating from different sources into a common database.
- Raw data and descriptive visualisations of programme details, stakeholder perceptions, and comparison to a reference.
- Full interactive implementation of the evaluation framework, which can be used for hypothesis generation of good practices.

Figure 4 depicts an example of an interactive visualisation provided by the engine.

Visit the ACT portal at [http://www.act-program.eu](http://www.act-program.eu). Here you will find in-depth details regarding the methodology, evaluation framework, tools, additional background information, and news related to the ACT programme.
Figure 4 Screenshots of the evaluation engine.

a) Summary of the overall survey responses per question.
b) Detailed overview of responses per question.
c) The overall survey score for two selected regions.
d) Overview of survey questions mapped to domains.
e) Detailed scores per domain for two selected programmes.
2.2 **Stratification details and process**

Risk prediction modelling is a priority for the implementation of integrated care at a European level.

One of the key challenges generated by large-scale deployment of integrated care services is the need for dynamic health risk assessment, both at population level and in the clinical scenario. This helps to feed adaptive case management strategies. Particularly those aimed at covering the evolving requirements of chronic patients over time.

**Summary of results**

All five ACT regions agree on the relevant role of population-based health risk assessment for regional deployment of integrated care. Please clarify the concept: There is also consensus on the use of population health stratification and not clinical or individual stratification. That is, health risk assessment tools generated from modelling the entire population of a given region (or geographical area) with a holistic approach.

The evolution of risk prediction modelling tools allows proper quantification of sensitivity/specificity of the estimations.
### Regional risk prediction modelling tools

Our observations show the use of diverse regional risk prediction modelling tools. Together with the criteria for health risk strata classifications, these preclude comparability of risk pyramid distributions among ACT regions (Figures 5 and 6). Likewise, different problems associated with data management preclude appropriate comparisons of the recommended indicators.

We also identified issues with license binding constraints, and insufficient transparency of some computational algorithms. These may limit transferability of population-based health-risk assessment among regions. These two factors might also preclude the adaptation of current risk prediction tools.

Especially for the following evolving requirements:
- Integration between healthcare and social services.
- Implementation of synergies between population-based and clinical health risk prediction modelling.

There are innovative strategies for individual health risk prediction models, which can be applied in different clinical scenarios. The ACT work has reported on the conceptual steps required to develop these strategies. Further studies are needed to evaluate their feasibility, added value and clinical applicability.

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<table>
<thead>
<tr>
<th>Model</th>
<th>Basque Country</th>
<th>Catalonia</th>
<th>Lombardia</th>
<th>Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictive</td>
<td>Explanatory (based in Adjusted Clinical Groups-Predictive Model ACG-PM®)</td>
<td>Classificatory (based in the Diagnosis Related Group, DRG, and a self-developed scheme CReG)</td>
<td>Classificatory (Scottish Patients at Risk of Readmission and Admission, SPARRA-3)</td>
<td></td>
</tr>
<tr>
<td>Source population</td>
<td>2,100,000</td>
<td>7,800,000</td>
<td>100,000</td>
<td>3,400,000**</td>
</tr>
<tr>
<td>Updates</td>
<td>Annual</td>
<td>Semester</td>
<td>Once</td>
<td>Monthly</td>
</tr>
<tr>
<td>Scope of the use</td>
<td>Population-based risk assessment and stratification for health policy and service design, as well as use as case finding tool</td>
<td>Population-based risk assessment and stratification for health policy and service design, as well as use as case finding tool</td>
<td>Case finding tool and reimbursement model</td>
<td>Case finding tool</td>
</tr>
<tr>
<td>Clinical application</td>
<td>- All levels of care can see the same information.</td>
<td>- All levels of care can see the same information.</td>
<td>- All levels of care can see the same information.</td>
<td>- All levels of care can see the same information.</td>
</tr>
<tr>
<td></td>
<td>- Practicing physicians receive a risk score for each patient</td>
<td>- Practicing physicians receive a risk score for each patient</td>
<td>- Practicing physicians receive a risk score for each patient</td>
<td>- Practicing physicians receive a risk score for each patient</td>
</tr>
<tr>
<td>Outcomes (dependent variables)</td>
<td>Mainly: Health costs</td>
<td>Mainly: Unscheduled hospital admissions at one year, re-admission at 180 days and risk of death at 12 months</td>
<td>Costs of pharmacy, outpatient and inpatient costs</td>
<td>Individual’s risk of emergency hospital inpatient admission over the next twelve months. Risk of Institutionalisation</td>
</tr>
<tr>
<td>Covariates (independent variables)</td>
<td>- Demographic information</td>
<td>- Demographic information</td>
<td>The classification system uses diagnosis for grouping</td>
<td>- Demographic information</td>
</tr>
<tr>
<td></td>
<td>- Diagnosis</td>
<td>- Diagnosis</td>
<td></td>
<td>- Diagnosis</td>
</tr>
<tr>
<td></td>
<td>- Comorbidity using a grouper</td>
<td>- Comorbidity using a grouper</td>
<td></td>
<td>- Comorbidity using a grouper</td>
</tr>
<tr>
<td></td>
<td>- Past health care consumption</td>
<td>- Aggregated socio-economic status</td>
<td></td>
<td>- Past health care consumption</td>
</tr>
</tbody>
</table>

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*The Northern Netherlands was not included in the figure because the integrated care programmes are not using population-based health risk predictive modelling tools.

**The total population of Scotland is 5,295,000 inhabitants.
<table>
<thead>
<tr>
<th>Scope of the stratification strategy</th>
<th>Basque Country</th>
<th>Catalonia</th>
<th>Northern Netherlands</th>
<th>Lombardia</th>
<th>Scotland</th>
<th>Barriers for comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire population (population health)</td>
<td>Population (population health)</td>
<td>Programme (population medicine)</td>
<td>Programme (population medicine)</td>
<td>3.4 million people (population health)</td>
<td>Heterogeneous predictive modelling tools</td>
<td></td>
</tr>
</tbody>
</table>

| Current predictive modelling tool | ACG-PM | GMA (owned by the region) | Not available | CReG, evolving toward a risk predictive modelling tool | SPARRA v3 (owned by the region) | Different statistics describing predictive power, different levels of flexibility |

| Number of risk strata | Four | Five levels of complexity & Seven levels of multi-morbidity | Four | Three | Four | Different criteria for risk categories leading to non-comparable population distributions |

| Characteristics of reporting on top indicators | Regional & micro system | Regional & four areas | Three programmes | GReG cohorts | Sub-region | Heterogeneity of reporting allowed conceptual consensus but not comparability of results |

ACG-PM® = Adjusted Clinical Groups-Predictive Model  
CReG= Chronic Related Group  
SPARRA V3= Scottish Patients at Risk of Readmission and Admission- version 3

Figure 6 Risk prediction strategies and characteristics of data reporting for the study on top indicators in the five ACT regions
Health risk assessment should employ a population-health approach. Both for risk prediction modelling and indicators. This is a priority for the scale up of integrated care at a European level.

### Risk Stratification

Risk stratification is a statistical process to determine and quantify characteristics associated with an increased or decreased chance of experiencing unwanted outcomes. By identifying factors prior to the occurrence of an event, it is possible to develop targeted interventions to mitigate their impact.

Risk stratification provides a rationale for allocation of resources to those patients at highest risk. To improve outcomes, and change their cost structure, healthcare organisations must design population health management interventions that target high-risk, high-cost patients who need to be managed carefully and proactively. A critical aspect of this is understanding multimorbid conditions.

Risk prediction modelling is also useful for screening purposes. That is, looking for discovery of cases with non-manifest illnesses that may benefit from early diagnosis and cost-effective preventive interventions.

In the clinical scenario, risk prediction of well-defined medical problems can support health professionals in the decision making process. Moreover, clinical risk prediction may contribute to patient classification in the optimal healthcare tier. Helping to define shared care arrangements between primary care and specialists.

### Recommendations

1. **Evolve** to an open, transparent and flexible population-based health risk assessment tool (figure 8). This will ensure transferability among EU regions.

2. **Facilitate** comparisons among regions. Harmonise data coding, and standardise logistics for data collection and reporting.


<table>
<thead>
<tr>
<th>Domain</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of risk stratification tool</td>
<td>Predictive model using a population health approach</td>
</tr>
<tr>
<td>Validation of the model</td>
<td>Longitudinal follow-up</td>
</tr>
<tr>
<td>Predicted/explained outcomes</td>
<td>Hospitalisation; risk of Institutionalisation; Death</td>
</tr>
<tr>
<td>Source sample</td>
<td>Whole regional population</td>
</tr>
<tr>
<td>Statistical model</td>
<td>Predictive modelling</td>
</tr>
<tr>
<td>Statistical indices</td>
<td>Standardisation on reporting performance (positive predictive value, PPV)[24] and sensitivity across risk bands</td>
</tr>
<tr>
<td>Population usefulness</td>
<td>Risk adjustment; planning and commissioning health services</td>
</tr>
<tr>
<td></td>
<td>Support to novel reimbursement models</td>
</tr>
<tr>
<td>Clinical and social usefulness</td>
<td>Identification patients at high risk and cost-effective preventive clinical and social interventions</td>
</tr>
<tr>
<td>Periodicity of updates</td>
<td>Semester</td>
</tr>
<tr>
<td>Clinical accessibility</td>
<td>Available into the professional workstation through CDSS</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Transparent algorithms, open source, reduced or no licence binding, High transferability</td>
</tr>
</tbody>
</table>

Figure 8 Stratification recommendations for best practice.
3.4 Assessment recommendations

Assessments

1. Ensure achievable data collection
ACT recommends the agreement on a minimum dataset of outcome indicators to be collected by all CC&TH programmes. This proposal data set (Figure 9) should be consensused and validated across Europe:

<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case ascertainment</td>
<td>Coverage of the target population</td>
</tr>
<tr>
<td>Health outcomes</td>
<td>a. Mortality /Survival</td>
</tr>
<tr>
<td></td>
<td>b. Hospitalisations per patient</td>
</tr>
<tr>
<td></td>
<td>c. Polypharmacy patients</td>
</tr>
<tr>
<td>Clinical management goals (per type of program).</td>
<td>Management goals are reached</td>
</tr>
<tr>
<td>Process outcomes (per type of program).</td>
<td>Processes are performed</td>
</tr>
<tr>
<td>Service utilisation</td>
<td>a. Total hospitalisations days (# &quot;days)</td>
</tr>
<tr>
<td></td>
<td>b. # Readmissions (30 days), per patient</td>
</tr>
<tr>
<td></td>
<td>c. Adequate use of emergency, per patient</td>
</tr>
<tr>
<td>Economic outcomes</td>
<td>a. Total cost per patient</td>
</tr>
<tr>
<td></td>
<td>b. Transition of resources towards primary care</td>
</tr>
</tbody>
</table>

Figure 9 Minimum data set for efficiency and efficacy outcomes.

2. Ensure data comparability across regions
Address data collection challenges (comparability, ambiguity), with a small set of strictly defined indicators. For instance, following relevant standards such as HL7 Health Quality Measure Format (HQMF). This will provide the structure in which eMeasures can be defined.

3. Facilitate local data collection and governance
The facilitation of unified data collection through interfaces, conforming to data privacy and protection legislation. Together with a distributed engine, where regions are in control of data entry to address data availability.

Enabling access to patient level data to track adequately patient populations, and allow the optimal use of machine learning techniques and big data.

4. Take a holistic evaluation approach
For a holistic assessment of the programmes, not only outcomes are needed. ACT recommends:
• Combine qualitative and quantitative indicators to provide the full picture: ACT Evaluation Framework.
• The application of the Evaluation Engine to monitor progress of existing deployments, and the effect of changes to existing deployments.

5. Scale the evaluation of integrated care across Europe
ACT recommends the EC to promote further initiatives in the implementation of evaluation of integrated care programmes:
• Implementation of the recommendations to enable a continuous improvement system that would bring the required maturity level of the programmes.
• Transfer of good practices in other regions to facilitate faster deployment in follower systems.