Sustainability and Transformation Planning
A Learning Health System solution

White Paper

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Contents

References

NHS - Leading Large Scale Change: A practical guide 11 September 2017

1. Purpose

This White Paper promotes the development, adoption and widespread use of digital Learning Health Systems as a solution to the Sustainability Transformation and Accountable Care System challenges facing local health communities in achieving the 'Quadruple Aims' of;

Improved health and wellbeing, transformed quality of care delivery, sustainable finances and improved staff satisfaction

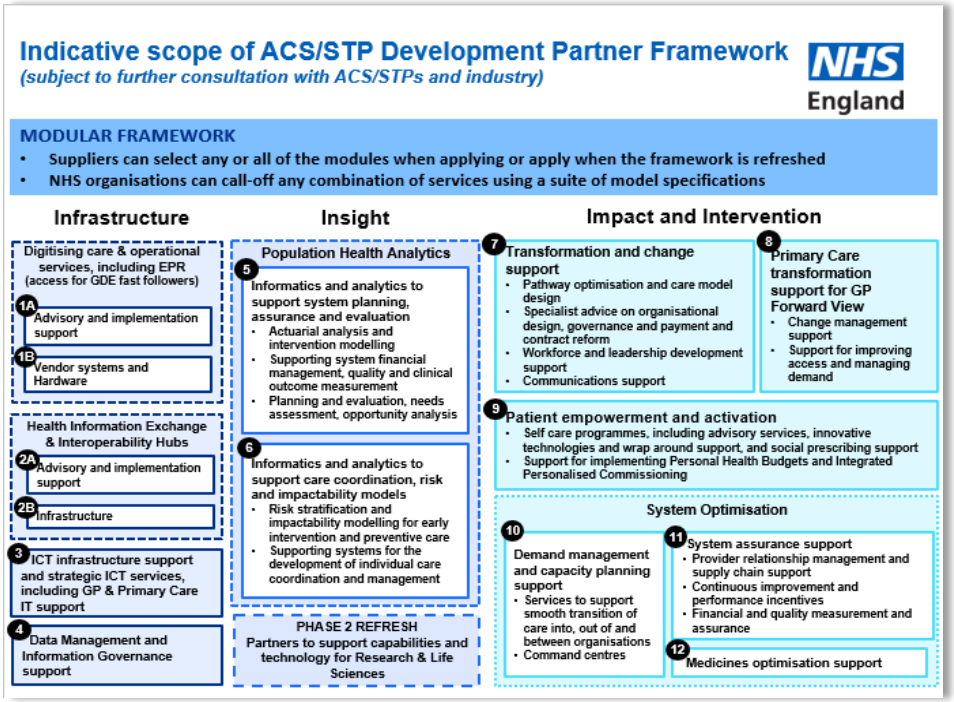
The authors are Ethos Partnership who have based the paper on their population health management research over a 6 year period. That research has involved a wide range of key stakeholders including clinicians, healthcare organisations, academia and industry.

2. Background

This paper specifically responds to the NHS England consultation published in October 2017 on the proposed ACS/STP Development Partner Framework (summary below).

A review of current transformation practice shows that current decision tools, transformation service support and collaborative working processes (where they exist) focus on organisation not place, activities not outcomes, transactions not transformation, backward not forward-looking views and 'analytics' not continual learning. A complete new set of scaleable capabilities is required for health communities engaged in the STP/ACS process.

In response to the Framework, this paper sets out generic health community needs and a Learning Health System response. Given the sheer scale of change envisaged over short timescales, an enterprise level, digital solution is asserted as the only viable option.



3. Generic needs assessment

This paper sets out to systematically define the current position and the generic needs of health communities engaged in place-based transformation as an Accountable Care System development. It has been developed following a review and synthesis of the work of:

- Local health communities
- NHS bodies (including NHS Improvement)
- Thought leadership organisations
- Academic research work
- Service improvement/consulting organisations
- External organisations (as world class exemplars)

In order to facilitate communication, the information has been structured in terms of the NHS Large Scale Change Model:

• Shared purpose	• Improvement tools
• Leadership by all	• Measurement
• Spread and adoption	• System drivers
• Project and performance management	• Motivate and mobilise.

4. Learning Heath Systems solution

Whilst no 'official' LHS definition exists, the 2015 Institute of Medicine reference is used as a working guide:

> An LHS is where *"science, informatics, incentives, and culture for continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience."*

An LHS can operate at various scales from individual patients to health communities to a regional and national level. *However*, the most powerful lessons and the greatest benefits will be secured at regional and national level. Scalability is key from the outset.

This paper asserts a knowledge rich, cost effective, scalable LHS solution will provide significant benefit for health communities engaged in STP/ACO transformation.

5. Tailored LHS solutions

Whilst alternative change models, national body initiatives, government changes etc will occur, the key principles in this White Paper will not change. As a 'pure' LHS approach they can be quickly and easily assimilated to meet specific market facing requirements.

Appendix

Generic needs and LHS solutions

Contents

1. Needs and Solutions - summary

GENERIC NEED	LHS SOLUTION
Shared purpose	
A community wide method of creating a shared purpose based on common objectives, mutual understanding, strong relationships and trusted intelligence.	A risk-free simulation environment where communities can explore new service models, evaluate alternatives and reach consensus on 'one view of the world'.
Leadership by all	
A repeatable process for developing a collective form of leadership built on a strong change narrative and ongoing commitment.	A scalable simulation-based process which supports the development of inclusive leadership models on a national level.
Spread and adoption	
A repeatable process to support both the take-on of new health communities and the spread of best practice across those communities.	A pre-validated, collaborative simulation platform which can be tailored for *individual* community needs whilst promoting the transfer of *generic* best practice.
Project and performance management	
Using good project and performance management to effect system-wide behavioural change and the delivery of Quadruple Aim outcome measures.	A pathway-based simulation process for managing change in project and system terms - specifically geared to continuous learning and system development.
Improvement tools	
A suite of tools that can support continuous learning and system development at a local, regional and national level.	An integrated yet modular, enterprise level toolset to support the exploration, evaluation, communication, implementation and performance monitoring of change plans.
Measurement	
A systematic method for measuring the impact of individual change initiatives and overall health system performance in Quadruple Aim terms.	A systematic, outcome-based method for measuring both intervention impacts and ongoing system performance in Quadruple Aim terms.
System drivers	
A transparent governance method where communities can manage system drivers in terms of risks, finances, outcomes and incentives in Accountable Care System terms.	A dynamic, interactive toolset that allows communities to identify, align and manage complex multiple system drivers and outcomes.
Motivate and mobilise	
A scalable means of mobilising and motivating communities in transformational change activities and adopting new system-wide behaviour patterns.	A digital stakeholder management tool which can engage health communities *from the outset* on continuous process of learning and system development.

2. Learning Health Systems - key principles

a) Co design and development

A solution which supports the ongoing engagement of patients, carers and citizens with healthcare organisations, industrial partners, research institutions and national bodies in co-designing and co-developing transformational service change.

b) Population Health Management

A process which supports Population Health Management in Quadruple Aim terms across the whole healthcare continuum - measured in terms of population health/wellbeing, care quality/experience, per capita healthcare cost and workforce satisfaction.

c) Scope and coverage

A system-wide approach covering *structures* (organisations, policies, roles, resources) *processes* (patient journeys, procedures, information flows) and *behaviour* (mind-sets, trust, power, conflict, and learning) across multiple geographies and stakeholders.

d) Scalability and cost effectiveness

Scalability through a common - and thereby repeatable - pathway based framework across all Long-Term Conditions. Cost effectiveness through a focus on the major 12 disease burden conditions (and their co-morbidities) which together account for circa 60% of all healthcare activity.

e) Knowledge and evidence base

Solutions built on a conceptually strong knowledge platform covering epidemiology, population analytics, clinical design, outcome frameworks, resource and financial management structures. Evidence must be multi-source and multi-disciplinary but (critically) tested out against ‘what actually works’ at a local level.

f) Flexible enterprise solution

On one hand, an overall roadmap vision and enterprise solution is required to ensure scalability. On the other hand, the solution build must be flexible and sensitive to (developing) client needs. A modern ‘agile’ approach must be taken to solution development.

g) Informatics architecture

Conceptually *and* operationally strong informatics architectures and delivery platforms which are fundamentally built on a full understanding of population needs, the likely impact of proposed service responses and behavioural change requirements at a system level.

h) World class practice

As sustainable change cannot be delivered through incremental change only, a mechanism for introducing best and emerging practice from both healthcare and other industries (UK and internationally based).

3. Needs and Solutions - detail

1) Shared purpose

Place based transformation requires health communities to adopt a fundamentally different vision of the future from the status quo. Consensus and buy-in are essential.

a. New mind-sets and perspectives

Current position - Healthcare transformation is hugely complex with much 'entrenched' thinking and few opportunities for communities to 'think outside of the box'.

Generic need - A engagement 'space' is where teams can 'step back' to develop new ways of thinking, a new common language, changed ways of working and new 'mental models'.

LHS solution - A risk free simulation environment where teams can think creatively about service provision embracing all emerging practice from healthcare and other industries.

b. Whole system awareness

Current position - Organisational structures do not allow communities to fully understand the opportunities offered by whole systems transformation approaches.

Generic need - A learning process where *c*ommunities understand the real nature of whole system thinking, how it impacts Population Health Management and how system change can be successfully delivered in very different ways.

LHS solution - Simulation can set the 'context' for whole systems transformation by interactively engaging community in a digital representation of future healthcare systems.

c. Relationship building

Current position - Human factors are the biggest transformation barrier with change only happening at the 'speed of trust'. At a very practical level, relationship building takes time.

Generic need - An approach which both facilitates and accelerates the development of system wide relationships and building trust between individuals across organisations.

LHS solution - A simulation based means of facilitating the 'human process' of relationship building by helping communities 'engage-as-one' and build new multi-disciplinary teams.

d. Outcome aspirations

Current position - Quadruple Aim target setting is a new healthcare process with communities setting mutual goals and describing what change looks like if it came about.

Generic need - A simple process which allows teams to develop their joint aspirations in terms of Quadruple Aims - thereby becoming 'investors in' not 'buyers of' change.

LHS solution - Using simulation to support communities in interactively and progressively co-creating outcome aspirations.

e. 'Framing' the challenge

Current position - The '£30bn' sustainability challenge is accepted nationally but not so well 'internalised' at a local health community level.

Generic need - A means of bringing this challenge 'to life' for communities and identifying the key themes in terms of the multiple processes and systems where change will be focused.

LHS solution - Simulation can localise the challenge with community based intelligence and frame change plans in ways that have meaning for local stakeholders.

f. Value judgements

LHS solution - Value judgements are often made at a community level with little factual substantiation or identifiable planning assumptions.

Generic need - A rational basis for measuring 'value' as it relates to whole systems based transformation (defined and evaluated by stakeholders at meaningful intervals).

LHS solution - Simulation can provide a structured process for developing a balanced set of multi-dimensional outcome measures which form the best approximation of value.

g. Fundamental realignment

Current position - Transformation can focus on incremental change with limited ways of introducing step change best practice - either from healthcare or external industries.

Generic need - A method which will allows communities work to fundamentally realign their service offer across the whole health, care and wellbeing continuum.

LHS solution - Simulation can offer a risk-free means of exploring, evaluating and communicating the benefits of *genuinely* transformative service redesign.

h. Vision development

Current position - Methods of building shared purpose and collective visions tend to be unstructured, one-off, initiative based and neither robust nor repeatable.

Generic need - A common framework to progressively and interactively develop a vision for change - not only locally but also how that vision might align with regional/national programmes. The 'art of the possible' must be balanced with reality-cum-sustainability at a local level.

LHS solution - A virtual discovery process based on simulation for engaging stakeholders in co-designing complex transformation visions - binding teams around a shared purpose.

i. **Trade-offs**

Current position - At a practical level, trade-offs and 'complex dilemmas' are a day-to-day reality and in particular aligning anticipated outcomes with system drivers.

Generic need - A practical method which allows stakeholders to resolve and manage these trade-offs and complex dilemmas.

LHS solution - Simulation provides a dynamic, interactive environment where teams can assess, evaluate *and* manage the impact of complex transformation programmes.

j. Scalability across communities

Current position - Although shared purpose development is (righty) a *local* experience, the vision development *process* is *primarily* repeatable. Yet no scalable processes exist.

Generic need - A repeatable process to facilitate shared purpose development - firstly at health community/regional/national (and aligned at all three levels).

LHS solution - Although both content and personalities will (obviously) vary across communities, simulation will support a scalable approach to vision development.

k. Sustainability over time

Current position - Shared purpose development is typically a locally driven process with limited interface with the wider healthcare ecosystems.

Generic need - A process is required to create the self-sustaining ecosystem which (inter alia) can support vision development.

LHS solution - A collaborative simulation platform can help support a healthcare, industry and research based ecosystem to support shared purpose development.

Summary

Generic need - A community wide method of creating a shared purpose based on common objectives, mutual understanding, strong relationships and trusted intelligence.

LHS solution - A risk free simulation environment where communities can explore new service models, evaluate alternatives and reach consensus on 'one view of the world'.

2) Leadership by all

Place based transformation demands inspirational leadership - which is often in short supply. Many people must now become 'leaders' - beyond traditional organisational boundaries.

a. Change narrative

Current position - Change narratives often result from 'set piece' transformation planning and are issued periodically. Often, the failure of plans is not because of content but an inability to connect with people around on a solid narrative.

Generic need - Strong, evidence rich narrative which is continually refreshed through engaging 'storytelling' to attract new, active supporters who will support (and drive) change.

LHS solution - A systematic method for the development and communication of engaging evidence based narratives in written form or simulation-based visual discovery.

b. Social movements

Current position - Old style 'command and control' processes are unlikely to work in modern large-scale change environment. Social movements are now playing a central role.

Generic need - A process to support shifting the balance of power and redistributing leadership. Pulling change through putting it in the hands of the many not the few.

LHS solution - Simulation provides digital means to move people from thinking they 'must do' to 'wanting to do' change - and creating future leaders in the process.

c. Key stakeholders

Current position - Although transformation programmes must reach many stakeholders, a few key individuals can sometimes lead and inspire the change process.

Generic need - Once these key stakeholders have been identified, they need to be supported with the necessary 'tools of the trade' to carry out their job.

LHS solution - Simulation can provide a complete toolset to support these key stakeholders to engage with the community at large.

d. Leadership energy and momentum

Current position - Healthcare systems have difficulty in maintaining and refreshing leadership energy and momentum over extended periods.

Generic need - Both capability and capacity are required to support current and future leadership.

LHS solution - Simulation can provide a complete toolset to support systems leadership - locally, regionally and nationally.

e. Key themes

Current position - Processes do not exist to identify and communicate the key transformation themes that people can relate to.

Generic need - Supporting stakeholder communications at each incremental stage of transformation process - from vision through design to delivery.

LHS solution - Simulation provides a digital means for conducting a sustainable communications process.

f. Maintaining commitment

Current position - At a practical level, one of the biggest challenges in any transformation programme is maintaining commitment once implementation is underway.

Generic need - A process which embeds continual learning and system development as a 'way of life' in heath communities.

LHS solution - Simulation supports *a* process of continual learning and system development at a local, regional and national level.

g. Scalability across communities

Current position - in an era when the health service is trying to promote wider leadership skills (and reduce 'hero' leadership), few practical tools exist to support 'leadership by all'.

Generic need - an array of toolsets and processes is required to support and facilitate leadership development.

LHS solution - Simulation provides an ideal digital mechanism for building whole systems based leadership across health communities.

h. Sustainability over time

Current position - 'Leadership by all' will result in a very different leadership model with not only engagement of the whole local community but the healthcare ecosystem as a whole.

Generic need - Tools and processes are required to develop a collaborative leadership system across the healthcare ecosystem.

LHS solution - Simulation provides a digital means to effectively engage a new 'leadership by all' business model - leveraging healthcare, industrial and research organisations.

Summary

Generic need - A scaleable process for developing collective leadership built on a strong change narrative and ongoing commitment.

LHS solution - A scalable simulation-based process which supports the development of inclusive leadership models on a national level.

3) Spread and adoption

Placed-based transformation at scale and pace requires best practice to be captured and disseminated across multiple geographies, multiple organisations and stakeholder groups.

a. Capturing and disseminating best practice

Current position - Much good work exists but effective and efficient scale up requires a scalable 'engine' to systematically capture and disseminate best practice.

Generic need - A digital 'conduit' to capture best practice at both an overall system and a specific initiative level - targeted at those with the greatest population health benefit.

LHS solution - Simulation provides a digital engine to capture and disseminate generic best practice - critically tailored at a local level through community specific intelligence.

b. New site support

Current position - Notwithstanding the transfer of best practice, new sites do not have 'ready-made' support packages to support their transformation activity.

Generic need - Pre-validated evaluation tools should be provided to all sites, so they can assimilate best practice for themselves - based on their own local intelligence.

LHS solution - Simulation provides a digital backbone for proactively supporting new site take on and encouraging them to undertake the evaluation of successful best practice.

c. Common pathway architectures

Current position - Whilst a pathway focus is starting in STP plans, a planning 'architecture' has yet to emerge. Whilst external industries must 'create' business planning architectures, healthcare's is 'readymade'. A pathway is a pathway!

Generic need - A common planning architecture which focuses on the 122 (recognised) Long Term Conditions ('LTC') which account for 74% of all healthcare activity.

LHS solution - Simulation solutions are built on a repeatable pathway based framework which in terms of cost effectiveness focuses on the top 12 LTCs which account for c 60% of all healthcare activity.

d. Multi-site comparison

Current position - No structured basis exists for multi-site comparison and benchmarking for knowledge, intelligence and insight sharing purposes.

Generic need - A common structured process for benefits extrapolation, causal link identification, value for money assessment, sustainability analysis and understanding population health outcomes.

LHS solution - Simulation can provide a 'digital conduit' for the progressive collation, synthesising and comparison of knowledge, intelligence and insights.

e. Capability and capability building

Current position - Systematic methods do not currently exist for building whole system based transformation capacity either at local, regional or national level.

Generic need – An approach that provides for both *capability* and *capacity* scale up. *Capability* in the form of formal programme for developing whole systems based transformation capacity at all levels. *Capacity* in the form of digital service delivery.

LHS solution - A simulation based LHS provides a systematic means for capability building in terms of knowledge transfer/skills development and capacity in the form of cost effective, repeatable health community services.

f. Scalability across communities

Current position - No scalable infrastructure or 'enterprise' scale tools exist for either site support or learning transfer.

Generic need - Without such enterprise scale solutions, place-based transformation will not succeed. An enterprise scale solution is required.

LHS solution - Simulation provides an ideal platform to build an enterprise scale LHS at a local, regional and national level.

g. Sustainability of change

Current position - Although it is recognised that a healthcare ecosystem is required to firstly create and secondly sustain changes in healthcare, no support mechanisms currently exist.

Generic need - A method is required that brings together a whole health ecosystem (healthcare organisations, industrial partners and research organisations) to create and sustain long-term healthcare change.

LHS solution - Simulation provides a digital infrastructure for enlisting and maintaining the ongoing support of the wider healthcare ecosystem in delivering scalable change.

Summary

Generic need - A repeatable process to support both the take-on of new health communities and the spread of best practice across those communities.

LHS solution - A pre-validated, collaborative simulation platform which can be tailored for individual community needs whilst promoting the transfer of generic best practice.

4) Project and performance management

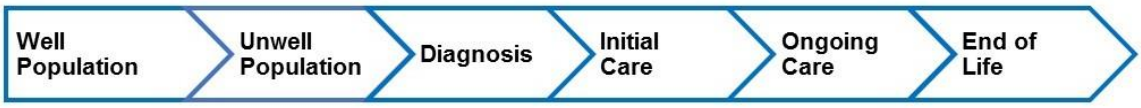
Place based transformation requires a common and consistent approach to project and performance management.

a. Structure, process or behaviour?

Current position - Transformation has 1) *structural* (organisations, policies, roles, resources), 2) *process* (patient journeys, procedures, information flows) and 3) behavioural (mind-sets, trust, power, conflict, and learning) prerequisites. Currently addressed separately.

Generic need - A method that reconciles and integrates all three perspectives in one project and performance management approach.

LHS solution - Simulation integrates these perspectives through a condition pathway model. Put simply it models the 'real world' through one framework - common to all LTCs. As the approach is a standard one, it lends itself to repeatable software solutions.



Many external industries with multiple sites call this a 'business process architecture'.

b. Transformation frameworks

Current position - Planning frameworks are a mix of resource, clinical and financially based structures. This results in one off, fragmented and non-repeatable approaches.

Generic need - A framework which again represents real world transformation planning and implementation processes.

LHS solution - Simulation provides a common and consistent cohort based approach based on agreed pathways structures – covering the whole transformation cycle.

c. Pre-validation

Current position - Current decision-making tools are not pre-validated in epidemiology, clinical, financial, outcome and resource management terms.

G*eneric need* - Decision making tools should be pre-validated at a national level - whilst preserving the integrity of localised solutions at a health community level.

LHS solution - Simulation of offers a solution where models are pre-validated structurally leaving communities to populate models based on local intelligence.

d. Openness and transparency

Current position - Transformation decisions are often taken on opaque assumptions which have been neither shared nor agreed - 'black box' decision making.

Generic need - A governance and decision-making process in which all decisions are open and transparent in terms of underlying assumptions.

LHS solution - Simulation provides a reliable decision-making toolset for making underlying assumptions open and transparent for scrutiny and review.

e. Appropriate baselines

Current position - Transformation baselines (the 'as-is') are frequently neither clear nor agreed as a planning baseline.

Generic need - A formal process for baseline development and agreement in terms of service level performance, outcomes, costs etc.

LHS solution - Simulation compares 'as-is' and 'to-be' scenarios and uses a formal process to set baselines at the outset.

f. Alternative service models

Current position - There are no current means of exploring and evaluating the impact of alternative service models – from other English or UK organisations or further, other countries.

Generic need - A process is required for exploring, evaluating and communicating the benefits of alternative service models in outcome based terms.

LHS solution - Simulation provides a process for exploring, evaluating and communicating the benefits of alternative service models in outcome based terms.

g. Planning and evaluation

Current position - Planning and evaluation processes are typically separate with continuous learning and system development becoming very difficult.

Generic need - A process where planning and evaluation develop 'hand in hand' - both for evaluating transformation plans and ongoing measurement and corrective action.

LHS solution - Simulation provides an integrated structure for planning and evaluation – across the whole transformation cycle.

h. Strategic alignment

Current position - Local initiatives must be aligned (where appropriate) with regional and national aims, strategies, initiatives and structures.

Generic need - A method where national guidelines/principles can be embedded locally whilst supporting local ownership of localised solutions.

LHS solution - Simulation delivers nationally pre-structured transformation improvement models which can be tailored with localised intelligence at community level.

i. Causal links

Current position - Healthcare transformation is the most complex of *any* industry. Few techniques exist for causal/benefits linking and identifying unintended consequences.

Generic need - Static logic model approaches need to be extended to cover the dynamic appraisal of causal factors and complex system drivers.

LHS solution - Simulation is purpose designed (through algorithms) to identify and communicate causal links and unintended consequences.

h. Behavioural change

Current position - Evidence collection is important but scaleable change should focus on hearts, minds and human behaviour as well expanding evidence bases.

Generic need - A scalable process for changing system-wide behaviour at local, regional and national level.

LHS solution - Simulation can provide a scalable method of engaging disparate shareholders in complex transformation with a focus on behavioural change. Much successful experience can be brought to bear from other industries.

j. Scalability across communities

Current position - With a focus on single community sites to date, scalable project and performance management processes have yet to develop.

Generic need - Place based transformation requires a common and consistent approach to project and performance management.

LHS solution - Simulation can provide a scalable solution for project and performance management at a local, regional and national level.

Summary

Generic need - Using good project and performance management to effect system-wide behavioural change and the delivery of Quadruple Aim outcome measures.

LHS solution - A pathway-based simulation process for managing change in project and system terms - specifically geared to continuous learning and system development.

5) Improvement tools

Place-based transformation requires the appropriate analytical resources. Teams must have a full understanding of population needs, the likely impact of proposed service responses or behavioural change required at a system level.

a. Informatics infrastructure

Current position - Informatics infrastructures were designed to meet individual care organisations' needs - not complex, multiple condition care.

Generic need - An enterprise information architecture to capture, process, store and communicate data to support complex transformative care programmes.

LHS solution - Simulation uses a purpose-built information architecture to support place based transformation in terms of cohort needs, likely service responses and anticipated outcomes.

b. Fostering innovation

Current position - Notwithstanding the transfer of external best practice, communities lack support processes to foster innovation.

Generic need - Tools and methods to support innovative and step change transformation on repeatable health community basis.

LHS solution - Simulation generates trust among a group of partners and triggers interest among others which breeds innovation. 'Think like a system, act like an entrepreneur'.

c. Impact assessment

Current position - Local teams cannot assess the impact over time of their transformation plans. Quadruple Aims cannot be assessed conceptually let alone practically.

Generic need - A dynamic system to evaluate alternative service models in terms of multiple outcome indicators - with all assumptions open and transparent for scrutiny and review.

LHS solution - Simulation uses algorithmic means to provide an assessment toolset to evaluate the Quadruple Aim impact of alternative service models.

d. Single conditions

Current position - Focus will continue on single pathway transformation but with an increasing focus on their co-morbidities. Without entrenching 'silo based care' yet further, much work has still to be done and much to be learnt from single pathway transformation.

Generic need - This condition pathway is common to all LTCs - so it lends itself to repeatable decision-making tools and solutions. When considered with related co-morbidities, a systematic approach to a single pathway service redesign will not only have immediate pathway benefits but wide learning re complex service redesign.

LHS solution - Simulation focused on single pathways and their co morbidities is increasingly being used as an important 'stepping stone' towards an understand full complex care service provision. Fundamentally, as a start point for communities to understand population need, likely service responses and their impact on anticipated Quadruple Aim outcome targets.

e. Complex care

Current position - With an accelerating focus on complex care driven transformation, future service responses will be very different to the present. Many initiatives are underway (e.g. the Electronic Frailty Index) but much development work is needed.

Generic need - Toolsets and processes to support the development of complete new system-wide mind-sets on the one hand coupled with service responses based on multi-disciplinary skillsets, system-wide capacity and 'connectedness'.

LHS solution - Simulation provides communities with toolsets and processes which support new complex care definitions of population need, an understanding of the likely multidisciplinary service responses and their impact on anticipated Quadruple Aim outcome targets. Above all, simulation can support the industry as it moves through a once in a lifetime cultural change towards the delivery of sustainable integrated care.

f. Continuous learning and system development

Current position - Transformation is a long term continuous journey of planning, measurement, learning and corrective action with 'instant results' unlikely.

Generic need - A reliable platform to support community teams in continuous learning and system development.

LHS solution - Simulation integrates one-off service redesign projects into a continuous learning and system development.

g. Planning horizons

Current position - Short term planning routines exists (e.g. 30, 60, 90-day plans). So too do longer term, transformation planning cycles. *However*, processes tend not to be joined up - often leading to unintended consequences.

Generic need - A means to align short, medium and long-term approaches to transformation planning as a continuous journey of planning, measurement, learning and corrective action.

LHS solution – Simulation support multi-horizon perspectives to transformation looking forward to up to 20 years but more practically 5-7 years.

h. Product and service evaluation

Current position - No systematic method exists for evaluating the impact of new products and services in whole system terms (e.g. pharmaceuticals, digital products).

Generic need - A method for exploring which new innovations or technologies may be beneficial? Which alternative service models might be appropriate? At what cost? What are the anticipated outcomes? The financial impact?

LHS solution - Simulation provides a systematic solution for evaluating new products as an integral part of a whole system transformation programme.

i. Knowledge provision

Current position - The effectiveness of centrally collected evidence is limited if it cannot be localised at health community level.

Generic need - A system of knowledge provided through a semantic knowledge search engine and structured through a formal knowledge management methodology.

LHS solution - Simulation supports context sensitive knowledge search supported by a formal knowledge management process covering scanning, codifying, abstracting, disseminating, absorbing and continuous improvement.

j. Skills and workforce planning

Current position - Communities must be able to develop, retrain and retain a workforce with the right skills, values and behaviours with sufficient numbers in the right locations.

Generic need - In parallel with any transformation process, a skills and workforce planning capability is required.

LHS solution - Simulation provides the means to respond to different transformation scenarios with appropriate skills and workforce strategies.

k. Scalability across communities

Current position - The focus to date of improvement tools has tended to be at a single community level - and even then, with little regard for repeatability.

Generic need – Scalable tools are required which both support new take on and the sharing of emerging best practice across sites.

LHS solution - Simulation provides a complete solution both to support new take on and to share emerging best practice across sites.

l. Sustainability over time

Current position - Improvement tools - where they exist - are not yet fully used across the healthcare ecosystem.

Generic need - A common set of improvement tools to support place-based transformation to bind the healthcare ecosystems together to deliver joint solutions.

LHS solution - Simulation provides a structured, disciplined approach to project and performance management.

Summary

Generic need - A suite of tools that can support continuous learning and system development at a local, regional and national level.

LHS solution - An integrated yet modular, enterprise level toolset to support the exploration, evaluation, communication, implementation and performance monitoring of STP plans.

6) Measurement

Place-based transformation requires a robust Quadruple Aim measurement process for both impact assessment and population level health improvement overall.

a. Outcome measurement

Current position - Measurement processes are not designed to support a Quadruple Aim management approach.

Generic need - If healthcare processes are to be arranged around desired outcomes, the impact of alternative service models must be measured at a population health level.

LHS solution - Simulation supports (through algorithmic means) system-wide impact assessment of change proposals in Quadruple Aim terms.

b. 'Soft' measurement

Current position - Soft measures tend not to be used because it is 'too difficult' despite their (often critical) importance to successful transformation.

Generic need - A measurement process is required where soft measures are supported at both a conceptual and practical level.

LHS solution - Simulation supports the system-wide measurement of all Quadruple Aim outcomes through algorithmic means.

c. Early impacts

Current position - Early impacts/'quick wins' are critical in any change programme. Time and confidence are the key. The 'first mile of a thousand-mile journey' is often the most important.

Generic need - A 'light touch' measurement framework for communicating early impact benefits is essential but one which is aligned with overall measurement objectives.

LHS solution - Simulation supports and reinforces the communication of early win benefits in terms of changes which can be delivered nationally. The areas most likely to deliver tangible results can be identified in advance.

d. ***Experiential evidence***

Current position - Little evidence yet exists to validate integrated care at a health community level. Indeed, 'gold standard' RCT type approaches may actually be counter-productive.

Generic need - A process where evidence is driven by the best external evidence, but also tested against 'what actually works' locally.

LHS solution - Simulation supports a process of 'lived experience' which helps overcome cultural and organisational barriers by securing consensus and buy in.

e. Local indicators

Current position - Mechanisms do not exist at present to align local indicators with higher level regional/national strategies.

Generic need - A mechanism for 'cascading' indicators in a consistent manner with regional and national strategies - without being viewed as a top down 'diktat'.

LHS solution - Simulation provides an ideal mechanism for 'cascading' indicators in a consistent manner with overall national strategy – whilst allowing full local ownership.

f. Attribution

Current position - Few facilities exist to *e*nsure observed changes are not due to chance. In other words, can change be properly attributed to interventions.

Generic need - A mechanism for providing insights into the 'correlation or causation' debate and being honest about attribution.

LHS solution - Simulation can link change initiatives to Quadruple Aim outcomes through algorithmic means to determine attribution.

g. Logic models

Current position - There are significant benefits from the increasing use of 'logic models'. However, these models are still 'static' with no forward-looking features.

Generic need - A capability to extend the use of logic models in terms of interactive, dynamic, future looking evaluation of service change based on live population intelligence.

LHS solution - Simulation creates a dynamic version of a logic model which can then be used to assess complex system-wide behaviour over time.

h. Continuous measurement

Current position - No processes exist for using measurement as part of a mid-to-longer term process of continuous learning and systems development.

Generic need - A process for embedding measurement in day-to-day working and creating a way to mutually reinforce change across multiple processes and subsystems.

LHS solution - Simulation provides a structure where communities can plan actions, measure progress, take corrective action and learn for the future.

i. Scalability across sites

Current position - Quadruple Aim measurement will become the de facto measurement standard which will influence and steer health community behaviour. However, this will not be a short transition period.

Generic need - A learning based solution where the concept and practice of whole system based measurement can be fully established.

LHS solution - Whilst simulation is not designed as an *ongoing* measurement tool, it can play a major role in selling and communicating the case for Quadruple Aim measurement.

Summary

Generic need - A systematic method for measuring the impact of individual change initiatives and overall health system performance in Quadruple Aim terms.

LHS solution - A systematic, outcome based method for measuring both intervention impacts and ongoing system performance in Quadruple Aim terms.

7) System drivers

Place based transformation and the anticipated scale of change attached thereto demands strong governance covering *all* system drivers.

a. Driver alignment

Current position - A Quadruple Aim approach dictates *all* systems drivers are aligned - not just clinical and financial. Current systems do not systematically support this need.

Generic need - A process where communities can interactively interpret, align and manage multiple system drivers in line with a balanced set of anticipated outcomes.

LHS solution - Simulation provides a mechanism where multiple stakeholders can interactively and proactively manage system drivers in line with Quadruple Aim targets.

b. Accountability

Current position - STP accountability frameworks do not yet support system-wide accountability.

Generic need - An accountability framework which provides a systematic means of setting and managing responsibility at a system-wide as well as at an organisational level.

LHS solution - Simulation provides an open and transparent solution for managing accountability at a system, organisational, pathway and financial (see below) level.

c. Financial drivers

Current position - System-wide financial control totals now represent a 'gross check' but more 'granular' approaches are now required.

Generic need - System-wide financial transparency at all levels in the transformation process at a system, organisational and at a condition pathway level.

LHS solution – Simulation provides an evaluation process (through an Activity Based Costing 'engine') which tracks/costs cohort flows to provide financial transparency.

d. Audit trail

Current position - Full system-wide decision-making audit trails are not available in current organisationally focused systems.

Generic need - A full audit trail is required which transparently records all major transformation decisions in terms of inputs, assumptions and outputs.

LHS solution - Simulation provides a capability to record a full audit trail for all decisions taken across the transformation cycle.

e. Risk management

Current position - System-wide risk can only be partially assessed prior to live implementation working.

Generic need - A fully transparent process where the key assumptions underpinning the transformation process are open and transparent.

LHS solution - Simulation provides a risk-free environment where underlying transformation planning assumptions can be assessed is risk terms - *prior to implementation*.

f. Capitated fee structures

Current position - Focused on individual organisations, systems do not support assessment and evaluation of capitated/population level fees structures.

Generic need - A method to develop transformation plans based on capitated, outcome based contracts - as a core method of systems management.

LHS solution - Simulation provides a capability to evaluate and manage the impact of service change proposals within a capitated fee structure. (e.g. ACO systems).

g. Payment mechanisms

Current position - Incentives often work against place-based transformation objectives and the types of behaviour they are trying to engender.

Generic need - A method for understanding the impact of 'perverse financial incentives' and managing tariff structures in terms of behaviour and outcomes - positive or negative.

LHS solution - A simulation based environment for identifying and managing the impact of perverse financial incentives - *before they happen.*

h. Scalability across communities

Current position - System driver management in healthcare is perhaps the most complicated in any industry. A full solution will only emerge over time.

Generic need - Repeatable tools and processes that will enable all health communities at all levels to understand and manage driver complexity.

LHS solution - Simulation provides a scalable method of system driver management at a local, regional and national level.

i. Sustainability over time

Current position - A comprehensive understanding and management of system drivers will only come at a healthcare ecosystem level.

Generic need – An approach to informing system driver management at a local, regional and national level.

LHS solution - Simulation can support an ecosystem approach to support a process of continuous learning and system development for system driver management.

Summary

Generic need - A transparent governance method where communities can manage system drivers in terms of risks, finances, outcomes and incentives in Accountable Care System terms.

LHS solution - A dynamic, interactive toolset that allows community teams to identify, align and manage multiple system drivers and outcomes.

8) Mobilise and motivate

Place based transformation is a people based process and must be supported by a well mobilised and well-motivated stakeholder group on a continuous basis.

a. Community mobilisation

Current position - Mobilisation is usually at a single organisation or 'one-off' transformation planning level. Formalised system-wide engagement processes have yet to emerge.

Generic need - A repeatable process for mobilising people from many different backgrounds and perspectives - inter alia including clinicians, care professionals, operational managers, transformation teams, public health, financial planners, patients and citizens.

LHS solution - A digital means to engage communities in a risk-free simulation environment which can harness their energies and ignite their imagination and enthusiasm.

b. Community motivation

Current position - Once mobilised on transformation programmes, it is often difficult to maintain the energy of the stakeholder base and keep them motivated.

Generic need - A 'space' where people can come together on a regular basis in continuous learning and system development.

LHS solution - A systematic risk-free simulation based environment where teams can test, fail, learn and evolve together.

c. Staff engagement

Current position - Transformation is critically dependent on the satisfaction of staff *as a whole.* Transformation programmes can sometimes ignore key team members.

Generic need - Methods to mobilise and motivate staff who are not directly involved in transformation activities.

LHS solution - Simulation can provide staff members with an understanding of the overall context of transformation - and their role within it.

d. Patient Public Involvement

Current position - To date PPI has focused on individual patients but the real gains in terms of transformational impact come from PPI at a population level. Letting user demand drive service change at a cohort level.

Generic need - A method for engaging patients, carers and citizens in population and/or cohort level transformation activities.

LHS solution - Simulation provides a visual, dynamic, interactive and graphical means of engaging all users in the transformation process.

e. Organisation and systems

Current position - Transformation activities should not revert to a 'silo based perspective' but current 'organisational form' is always a challenge in service redesign.

Generic need - An approach to transformation that continually supports the view that 'organisational form' should not define new care model design.

LHS solution - Simulation provides a continuous learning mechanism as to how care can be delivered from a pure population health perspective.

f. Devolved management

Current position - Devolved system-wide planning and management is not new in other industries but is in development stages in healthcare.

Generic need - A method where health care teams can learn for themselves in test/fail/learn/adopt terms but also learn from the experience of other industries.

LHS solution - A digital means of employing devolved management techniques based on self-learning and external best practice.

g. Gamification

Current position - Gamification is establishing a major presence in the health care industry at an individual patient level.

Generic need - A method of gamifying the place-based transformation process at a population health management level.

LHS solution - Simulation is ideally positioned to provide a solution for gamifying the transformation process.

h. Knowledge latency

Current position – In terms of anticipated delivery timescales, knowledge and learning takes far too long to 'work its way through the system'.

Generic need - A continuous learning and systems development process which substantially reduces the knowledge latency gap.

LHS solution - Simulation provides a live, interactive process where knowledge and learning can be recycled efficiently and effectively.

i. Scalability across communities

Current position - Although mobilisation and motivation processes are 'content free' and 'not locally based', repeatable and formalised approaches have yet to emerge.

Generic need - A repeatable process to support stakeholder mobilisation and motivation at a local, regional and national level.

LHS solution - Simulation provides a scalable method for mobilising and motivating stakeholders at all stages of the transformation cycle.

j. Sustainability over time

Current position - Mobilisation and motivation activity requires a significant amount of senior level resource. This will increase significantly as scale up plans progress.

Generic needs - A means to involve the whole healthcare ecosystem in local, regional and national transformation programmes.

LHS solution - A simulation based approach can provide the means to engage the whole healthcare ecosystem.

Summary

Generic need - A scalable means of mobilising and motivating communities in transformational change activities and adopting new system-wide behaviour patterns.

LHS solution - A digital stakeholder management tool which can engage health communities from the outset on continuous process of learning and system development.

4. Informatics architecture and platform

This White Paper does not make any detailed reference to informatics architectures and platforms.

The paper addresses the generic requirements of an LHS solution from an **'end user' health community perspective**.

However the following should be considered;

Conceptual design

1. Pathway architectures (singe conditions and complex care)
2. Clinical ontologies and resource management structures
3. Whole system simulation algorithms

Software

4. Software and documentation (user experience/ interface design and technical)
5. Product and service development Roadmap

Platform and infrastructure

6. Technical platform architecture
7. Network and interface specifications
8. Service delivery standards

Data strategy

9. Data capture schema
10. Electronic Health Records system structured query frameworks
11. Data capture project management
12. Interim data analysis
13. 'Safe harbour' storage

Service standards

14. Service provision and support
15. User group 'charter'
16. Implementation and 'how-to' manual
17. Lexicon of whole systems terms

Governance and management

18. Information Governance
19. Standard Operating Procedures
20. Security and disaster recovery