



*The***AHSN***Network*



## **SBRI HEALTHCARE**

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A review of the benefits of  
the Small Business Research  
Initiative in Healthcare

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## INTRODUCTION

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### Purpose of this report

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This report sets out a summary of findings of the independent review of benefits of the Small Business Research initiative in Healthcare (SBRI-H) carried out by PA Consulting in 2017. The review was commissioned by NHS England to assess the value from SBRI-H realised for the NHS in England so far, and the potential value from projects still in the pipeline. Delivering value to the NHS is not an explicit objective of SBRI-H. As a consequence the findings presented here are the result of a rapid review, drawing on secondary sources to understand how value is realised and the extent of any existing deployments to NHS. This report also highlights the wider social and economic impacts of the projects.

### Acknowledgement

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We would like to thank the companies that have contributed to this rapid review for their willingness to respond at short notice. The review was focused on addressing the key questions about financial value, and where possible we have captured wider impacts that have been put forward to show a broader picture. We would also like to thank the SBRI-Healthcare team, Health Enterprise England, NHS England and all those interviewed for their invaluable support and contributions.

This report also highlights the wider social and economic impacts of the projects.

## 2 SBRI HEALTHCARE PLAYS A KEY ROLE IN PROMOTING EARLY STATE INNOVATION FOR THE NHS

SBRI Healthcare (SBRI-H) is a sector specific programme, based on a broader UK-wide and multi-sector SBRI initiative. It was established to connect health challenges with innovative ideas from industry, supporting companies to generate economic growth and enabling improvement in achieving government objectives. NHS England assumed responsibility for sponsoring and funding the programme in 2012.

This report has been commissioned by NHS England to assess the value from SBRI-H realised for the NHS in England so far, and the potential value from projects still in the pipeline. Delivering value to the NHS is not an explicit objective of SBRI-H, as a consequence the findings presented are the result of a rapid review, drawing on secondary sources to understand how value is realised and the extent of any existing deployments to NHS. Where a range of possibilities is presented, the review errs on the side of caution, taking a conservative view of potential benefits to provide a robust baseline. Where possible, the report also highlights the wider social and economic impacts of the projects.

As of July 2017, SBRI-H has funded 176 projects and awarded contracts to the value of £73M. So far 37 projects are showing some deployment in the NHS, either through sales or trials. These are the projects with the potential to have already achieved an impact on the NHS. The assessment of current benefits has focused on a cohort of 8 projects assessed as having the highest potential to be achieving an impact based on reported sales, forecast economic potential and SBRI-H team knowledge of the companies. Together, the 8 projects account for 85% of current NHS sales and provide a sound basis for estimating the total impact to date.

The assessment of future potential has been based on a further cohort of 14 projects. These have been identified jointly with the SBRI-H team as currently showing the greatest potential for successful adoption and impact. While some are on the market, they have yet to achieve any significant NHS sales and there is no overlap with the 8 projects reviewed for current impact.

The review has identified projects estimated to have secured savings to date of between £24.6 and £30.1M including:

- Savings to date in the range of £13.1M to £18.6M for the NHS in England and £11.5M to other UK public sector organisations
- Annual recurring savings currently running at £19.1M per year, including £14.4M for the NHS in England, and this is forecast to increase as adoption spreads.
- Additional impacts to the economy from new jobs valued at £14.6M, sales outside of the NHS of £6.9M (which is one and a half times the value of sales to the NHS) as well as attracting a further £122M in private investment funding.

The values of current and annual recurrent savings are calculated from secondary data provided by the companies involved. The savings set out in this report have been based on the data received, and there is reasonable confidence that further savings will be present that have not been evidenced in this review.

┌ The 8 SBRI-H projects account for **85%** of current NHS sales and provide a sound basis for estimating the total impact to date.

<sup>1</sup> Data from SBRI-H survey.

<sup>2</sup> 'C' refers to the SBRI-H competition number: C10= Competition 10 etc. Since Competition 4 in 2012 there have been 2 competitions run each.

## SBRI projects assessed for current impact on the NHS

Table 1

Scheme	Details
<b>365 Response – Healthcab (Competition 10)<sup>2</sup></b>	Online market and service provider for non-emergency patient transport. Savings generated by faster and lower cost alternatives to public ambulance service transport for non-emergency patients.  Total SBRI funding £997,000
<b>Careflow Connect Ltd – TACTIC (Competition 5)</b>	Real time communications integrated into clinical workflows. Savings derive from two hospital deployments and relate to saved bed-days from improved management of acute kidney infection, and saved clinicians' time in handovers and communications.  Total SBRI funding £1,100,000
<b>Mayden House Ltd – PRISM (Competition 5)</b>	Online marketplace for digital IAPT services. The savings are generated by enabling a switch from face-to-face to clinically effective online therapies.  Total SBRI funding £537,000
<b>Advanced Digital Innovations (UK) Ltd – PainSense / MyPathway (Competition 4)</b>	Pain management and patient engagement platform. Savings are generated by reduced specialist referrals, improved self management and admin staff reductions arising from a move to digital communication with patients.  Total SBRI funding £886,000
<b>My mHealth Ltd – myCOPD (Competition 5)</b>	Self-management telehealth system for COPD. Savings generated by improved self care and avoided encounters.  Total SBRI funding £1,059,000
<b>Dynamic Health – Vitrucare (Competition 4)</b>	Online service adapted for communication between patients at home and their care team. Savings generated by reduced hospital days from improved EoL care planning and better home management of the condition of chemotherapy patients.  Total SBRI funding £997,000
<b>Isansys Lifecare Limited – Patient Status Engine (Competition 5)</b>	Automated patient observations and alerts through wearable sensors linked to a patient status engine.  Total SBRI funding £1,100,000
<b>Just Checking Limited – Just Checking for LD (Competition 6)</b>	Application of Just Checking for the monitoring of activities of daily living for the care of people with Learning Difficulties (Phase 3 only). Savings generated by identifying the right levels of care needed for LD patients, often reducing the level of overnight support.  Total SBRI funding £878,000

All savings are based initially on company reported information correlated with health economic appraisals of the innovation. The figures have been assured through reference to local NHS evaluations and examination of relevant peer-reviewed published evidence of similar services. In some cases, calculations have extrapolated savings from assessments done by the NHS on initial implementations in order to incorporate new deployments.

Reporting financial impact in this way has not been the central focus for these companies, nor has this been part of the mandate for SBRI-H and therefore has not formed part the data regularly collected by SBRI-H through surveys. Hence the available data does not fully cover all the possible financial benefits, nor does it always assess a direct impact.

It is difficult to ascribe a confidence level to the figures. Further financial benefits are likely to apply and changes in assumptions could impact on the figures, which have been calculated to give a robust and defensible estimate of value delivered to date. In assessing confidence in the estimates, two points are of note:

- A conservative approach has been taken and for most figures the benefits estimated are considered robust. For instance, in the case of one company the estimate used was the lowest value of estimated savings ranging from £1.8M to £5.7M.
- In the case of another project, peer reviewed sources published in recognised journals were used to cross reference figures quoted by the company. In this case a 50% confidence margin has been applied based on an assessment of the base data and relevance of the reported results to the reported use. This creates the lower bound for the range of current and recurring annual savings.

As well as the financial savings, the review identified through interviews a range of additional impacts on the NHS including:

- Non-cash releasing savings as a result of saved clinician time and reduced DNA rates.
- Improved quality and outcomes, such as improved uptake of PROMs to measure service quality, improved emergency ambulance related performance and improving access to services
- Improved patient experience by enabling interaction with digital services, reducing waiting times, improved information on appointments and improved ability to meet patient wishes at end of life.

The wider economic impact of SBRI-H to date is also significant, as shown in Table 2. These figures have been self-reported by companies in the annual SBRI-H survey



## Wider economic impact

Table 2

£6.9M	£14.6M	£122M
In sales outside the NHS including £0.5M in non-NHS UK sales	Estimated minimum value to the UK economy of 285 jobs created <sup>3</sup>	External investment attracted to SBRI-H projects

The assessment of wider economic impacts has been made with reference to company responses to SBRI\_H surveys and supplemented by SBRI-H reports of a significant subsequent transaction.

**The estimated cumulative future savings to the NHS enabled by the SBRI-H portfolio is expected to be of the order of £350M-£480M in 5 years ( 2022), rising to between £1.2Bn-£1.8Bn in 10 years**

The future value estimate is based on an assumption that, as an innovation portfolio, the main value will be derived from a small number of highly successful projects. The portfolio of 14 projects was selected on the basis of current potential to come to market and make an impact, taking account of views on the technology readiness of projects reported by the SBRI-H team.

These 14 projects represent 12.5% of the overall SBRI-H project portfolio. The estimate, shown in Figure 1, has been confidence-adjusted to account for the quality of the information used to develop the estimate. It takes account of the expected increasing returns as projects gain adoption by the NHS.

The projects within the group of 14 reflect a balance between medical device and digital projects that is closer to the overall split across the 176 SBRI-H projects than that found in the group of 8 projects used to assess current impact. The group of 14 also covers a range of forecast potential annual values and has therefore not been cherry-picked to highlight the highest claims. The projects range in the estimate of the full market potential of NHS savings from zero for an innovation that offers significant improvements in functionality and outcomes, but is cost neutral and therefore generates no cashable savings over the existing device, up to over £100M per year for a breakthrough home treatment device.

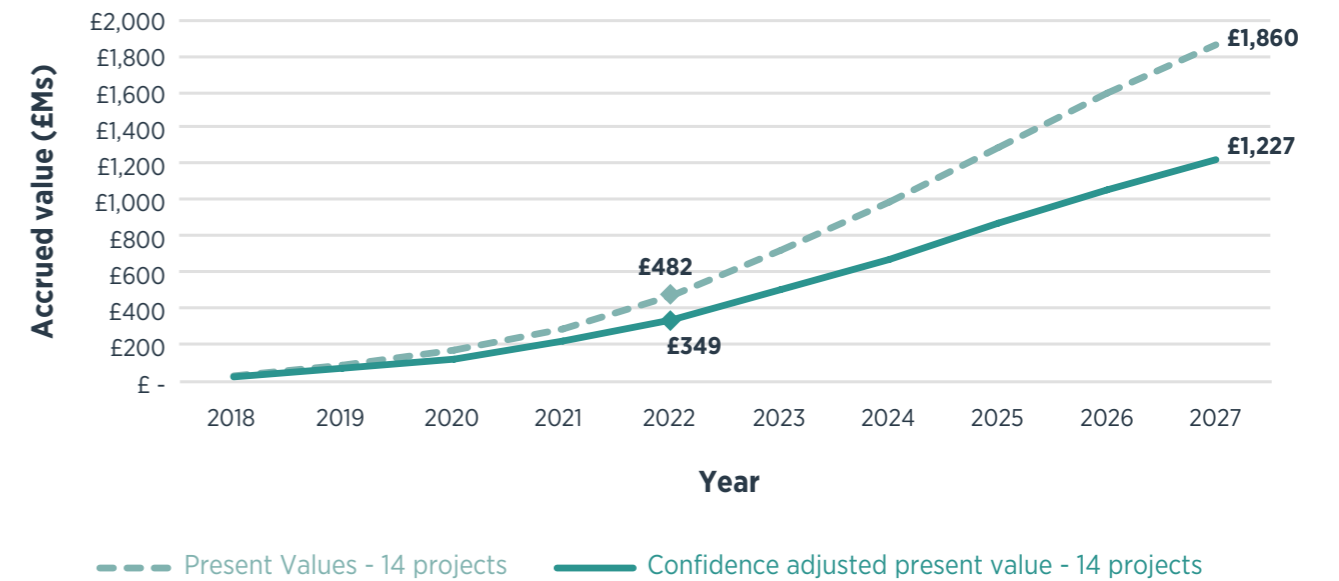


<sup>3</sup> Using the estimated value of a full time job in medical technology as £60K.

Figure 1

Forecast SBRI-H present value to the NHS in England with confidence adjustments

### Forecast Cumulative Present Value for the NHS in England (£Ms)



The future value forecast is based on:

- An assessment of potential annual economic value to the NHS, where relevant adjusted to reflect current evidence and an expected market share
- An adoption profile that takes account of expected time to achieve full market potential
- Demand growth has not been included in the valuation, although significant demographic and condition prevalence related growth would be expected
- The annual totals have been adjusted to a 'present value' based on a standard Treasury Green Book discount rate for economic assessments of 3.5%.
- A confidence adjustment has been made to reflect the quality and relevance of the information used in the baseline economic assessments.

**While it is still early in the innovation pathway to be expecting tangible benefits for the NHS, there are positive signs to indicate that SBRI-H is operating effectively and is on track to deliver significant value for the NHS as well as the UK economy as a whole.**

To understand how well the scheme compares with other life science projects, Figure 2 below sets out a comparison of timelines for SBRI-H projects and The Office for Life Sciences indicative timelines for companies seeking to develop medical devices.

SBRI-H projects are progressing relatively quickly compared to expectations for the medical device innovation pathway. As we would expect, digital projects have made up the majority of innovations currently in use, while in the longer term greater returns are expected from a few 'breakthrough' medical device innovations.

Figure 2

Forecast SBRI-H present value to the NHS in England with confidence adjustments

Creation	Development (Prototype)	Development (Trials)	Regulation	Endorsement/reimbursement	Commissioning and adoption
<b>Timescales by stage</b>					
1+ year	1-2 years	6 months - 1 year	1 month - 1 year	9 months - 3 years	2 years +
<b>Total time along pathway</b>					
> 2 years	2 -3 years	2.5 - 4 years	2.6 - 5 years	3.3 - 9.5 years	5.3 - 11.5+ years
<b>Expected place on pathway for each SBRI-H Competition</b>					
Competition 12 (Mar 7)	Competitions 8-11 (Apr 15 - Mar 16)	Competitions 4-11 (Aug 13 - Mar 16)	Competitions 3-9 (Sep 12 - Nov 15)	Competitions 1-7 (Nov 09 - Oct 14)	Competitions 1-3 (Nov 09 - Sep 12)
<b>Activities</b>					
Phase 1 Proof of concept/technology demonstrator	Phase 2 project - Working prototype	Scaling to production standard Clinical trials (if required) Evidence base to support approvals	MHRA approvals Evidence of fit for intended use or of substantial equivalence	Evidence of efficacy including cost-benefit analysis In use in early adopters for trials NICE HTA ITT/IPT tariff	Listed on NHS frameworks In use by the NHS

The level of recurring annual benefits from the companies studied for current impact reinforces the view that there is significant further potential. Seven of the 8 companies reviewed for a current saving reported an impact for the NHS in England (as opposed to impacts on social care services or NHS organisations in Scotland, Wales and Northern Ireland). The market penetration of these 7 projects is just 20% of their estimated market potential, which itself is already adjusted down for an expected maximum market share. The median average rate of adoption, which may be a better indication of the experience of the companies involved, is somewhat lower at 10%. One project, myCOPD, has seen a significant recent jump in adoption linked to the release of funding to the NHS through the ITT scheme. Of the remaining projects in the group, 4 reported a rate of adoption of 10%, or under. There are many more innovations moving through the pipeline awaiting their first NHS sales.

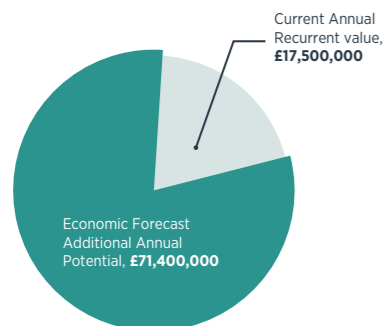


Figure 3

Current annual value and further NHS market potential of 7 health innovations from Competitions 4 & 5 that have achieved sales to the NHS in England

<sup>4</sup> Further details of the SBRI-H scheme and projects covered by the competitions are provided in the Supporting Analysis document. DN: bring into main document.

The review looked at the projects in Competitions 4 and 5 to understand the value returned by a whole investment portfolio. These two competitions were the first to be funded by NHS England, involving projects with Phase 1 proof of concept contracts awarded in the period Aug 13 - Mar 14. They are the NHS England funded competitions most likely to have seen products reach the market.

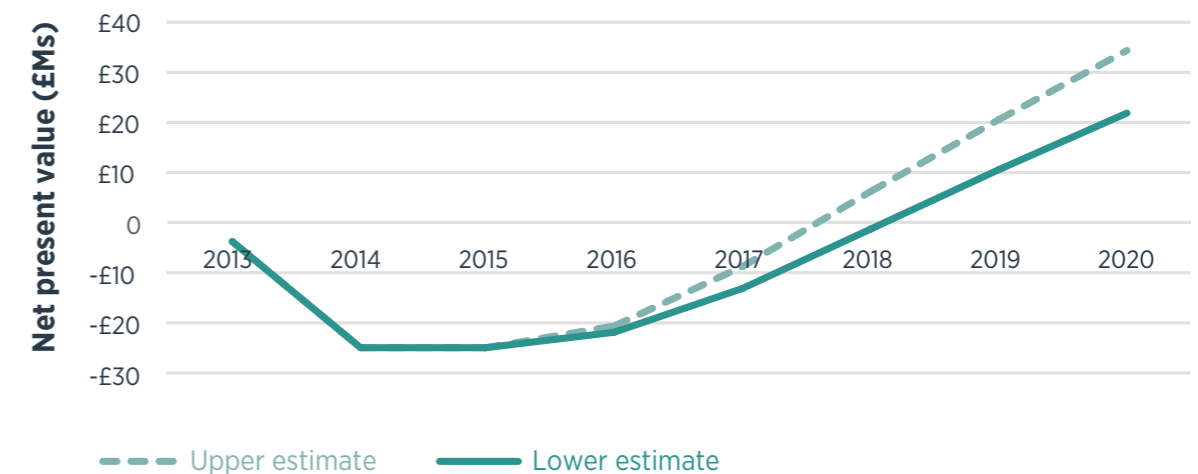
The estimated savings for the NHS in England to date are in the range £13.0M-£18.6M against an investment of £25.6M, with annual recurring savings currently running at a rate of between £14.4M and £17.5M. The present value is shown in Figure 4 and this indicates that the break-even point for projects in Competitions 4 and 5 will occur by mid 2018.

Figure 4 & 5

Net present value of projects showing current and recurring annual savings

Net Present Value - Competitions 4 & 5

Projects reporting current impact for the NHS in England



This is a strong performance given that it is only 4 years since the initial investments were made in Phase 1 early-stage feasibility studies. The longer term prospects for a return from Competitions 4 & 5 are still more positive. All projects that have been reviewed in detail would be expected to continue to deliver savings, most at a rate that will increase significantly as adoption spreads. In addition, there are three medical device projects from within this cohort showing strong long term potential.

The pace of adoption and spread by the NHS continues to be an issue. This is reflected in figures which show companies achieved sales outside the NHS over 1½ times the value of sales to the NHS. This is despite the fact that the innovations are an industry response to priority needs identified by NHS and endorsed by NHS England. This is perhaps not surprising given past experience of adoption by the NHS. As expected, digital projects have been faster to market than the medical devices.

It is clear that diffusion remains problematic. It may be early in the lifecycle to see an impact from new mechanisms such as the Innovation Technology Tariff (ITT), its replacement the Innovation Technology Price (ITP) and the NHS Innovation Accelerator (NIA) schemes. These difficulties in securing diffusion are illustrated by the experience of one company which was assessed as having a very strong case for economic benefits and positive impact on outcomes, yet the company reported making slow progress as a result of having to 'make the case to 100 separate buyers, each with their own views'.

<sup>5</sup> SBRI-H has awarded contracts in 3 stages - Phase 1 up to £100k for proof of concept, Phase 2 up to £1M for development of a prototype and Phase 3 for pre-commercial trials. See Supporting Analysis for further details

**The review identifies some considerations for realising future value from SBRI in Healthcare**

The purpose of this review was to assess the current and future value of the scheme, and it was not intended to review the way the scheme has been managed. Nevertheless, in valuing the impact of SBRI-H we identified a range of factors that will drive the return to the NHS and should be considered for the future. These are set out in Table 3 below.

Sector	POD
<b>Pace of adoption</b>	The pace of adoption remains a major obstacle to seeing a return on investment.
	Several projects have started to achieve significant sales outside the NHS
	Companies report positive outcomes arising from support through the ITT and NIA schemes
	There is a potential for NHSI and NHSE to take a stronger line in championing diffusion of innovations that have been shown to work.
<b>Procurement levers</b>	The lack of a clear route to market for innovations supported by SBRI -H has been highlighted by several companies as the most significant barrier to adoption.
	A stronger commitment to buy the most successful innovations from each competition would be expected to have a significant impact in improving adoption.
	A commitment to offer the ITP tariff for the most successful innovations in each theme would provide a clearer route to market for innovators.
<b>Speed of return on investment</b>	If the speed of the returns is to be a driving factor, the mix between digital and medical device projects should be considered.
	Some caution is needed. While digital innovations have been faster to market, medical device innovations are likely to generate more significant long term returns.
<b>Future SBRI-H reporting and valuations</b>	This review has been conservative in its approach to estimating potential savings to the NHS. This means that figures reported within this review may differ from previous valuations. In particular, this review has factored in an adoption profile, reducing the forecast returns in early years.
	<p>Future valuations should consider:</p> <ul style="list-style-type: none"> <li>• The probability that much of the portfolio will not succeed</li> <li>• Adoption timescale and time to market</li> <li>• Changes in the benefits case as the solutions developed and deployed.</li> </ul> <ul style="list-style-type: none"> <li>• Appropriate measures could be established to monitor and measure impact on the NHS and linked back to wider NHS improvement initiatives to create effective pull.</li> </ul>
<b>SBRI-H themes</b>	There is a potential tension between setting themes that change every 6 months and opening up opportunities for companies with ideas that can be of value. Broad themes, as have been used recently, give more scope for unforeseen innovation to be identified and supported.





# 3

## APPENDICES

### 3.1 Overview of SBRI healthcare

### 3.2 Abbreviations

### 3.3 Acknowledgements

# 3.1

## OVERVIEW OF SBRI HEALTHCARE

A pilot SBRI-H scheme was initiated in 2009. NHS England took over the sponsorship of the scheme in 2012, after Competition 3 contracts were awarded. At that time, significantly ramped up activity, with twice-yearly competitions and an increase in participation. NHS England is responsible for setting the themes for each competition and allocating funding. To date, SBRI-H has funded 176 projects and awarded contracts to the value of £73M. The first of the 152 projects initiated under NHS England sponsorship were awarded contracts in August 2013.

Competition	Total SBRI funding <sup>6</sup>	Feasibility (Phase 1)	Proto-type (Phase 2)	Pre-commercial	On market	Dis-continued	Total
1 (Nov 09)	£3,890,212	7	2	1	1		11
2 (Aug 11)	£4,074,677	3	2	1	2		8
3 (Sep 12)	£ 2,129,579		1		3	1	5
4 (Aug 13)	£3,734,320		1		4	3	8
5 (Mar 14)	£ 21,874,895	12	13		8	2	35
6 (Mar 14)	£ 3,096,465			2	2		4
7 (Oct 14)	£11,734,306	13	6		7		26
8 (Apr 15)	£6,977,465	6	5		3		14
9 (Nov 15)	£5,121,109	6	4		1		11
10 (Mar 16)	£6,568,358	8	4		3		15
11 (Mar 16)	£1,608,962	13			4		17
12 (Mar 17)	£2,133,978	21			1		22
<b>Total</b>	<b>£72,944,327</b>	<b>89</b>	<b>38</b>	<b>4</b>	<b>39</b>	<b>6</b>	<b>176</b>

Medical devices (35% by number and 38% by funding) and digital/ICT (53% by number and funding) make up the vast majority of the funded projects, with medical devices dominating the first 3 competitions and then reducing in later competitions.

Competition 5 has seen the greatest amount of funding being awarded to projects. As per the graph in Figure 5 below, the spread in funding is mirrored by the number of schemes being awarded with funding, however proportionally more funding was awarded in Competition 5 than any other.

<sup>6</sup> Note that the funding is the total project funding for all Phases. Funding allocated in subsequent years shows as related to the original competition for a Phase 1 project. As projects can span several financial years, the annual SBRI-H budget has to cover both new projects and continuation funding for ongoing projects.

Figure 5

SBRI funding by competition and scheme type

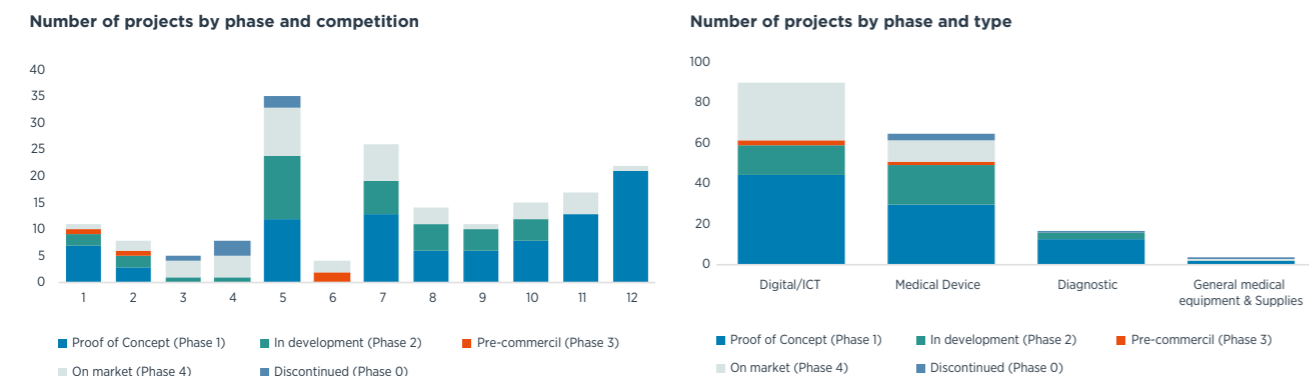


A breakdown of current reported progress in Figure 3 indicates that overall, 22% of the projects have achieved some sales or deployments. Of the projects that have reached the market, the proportion of digital projects is 72%, somewhat higher than the proportion of digital projects as a whole.

A more detailed analysis confirms expectations that Digital/ICT projects appear to be faster to market than medical devices. Beyond that it is hard to draw firm conclusions on the merits of a challenge-led versus an open innovation approach: the 12 competitions have involved 40 separate themes, with the most popular being broad themes on 'self-care' and 'long term conditions' attracting 9 and 8 projects respectively. The relatively low numbers of projects and big differences between the detailed objectives mean comparisons are of limited use in extrapolating potential value from the portfolio.

Figure 6

SBRI projects competition and development stage<sup>7</sup>



<sup>4</sup> 4 = On market; 0 = Discontinued

SBRI themes by competition

Table 5

Competition	Number of Themes	Description
1 (Nov 09)	3	Active Children, Managing Long Term Conditions, Patient Safety
2 (Aug 11)	1	Long Term Conditions
3 (Sep 12)	1	Medicines Management
4 (Aug 13)	2	End of Life, Mental Health
5 (Mar 14)	7	Cancer, Cardiovascular, COPD, Diabetes, Mental Health, Patient Safety, Research Tools
6 (Mar 14)	1	Phase 3
7 (Oct 14)	5	Child & Maternal Health, Integrated Care, Learning Disabilities, Medicines Adherence, Musculoskeletal
8 (Apr 15)	5	Brain Injury, Child and Adolescent Mental Health, Diabetic foot ulcers, Medical Imaging, Outpatient services
9 (Nov 15)	3	Falls, Functional Difficulties, Incontinence
10 (Mar 16)	3	Reducing Pressure on Urgent & Emergency Care - Coordinating Admissions in A&E, Preventing Admissions to A&E and Resource Planning in A&E
11 (Mar 16)	5	Acute Care - Hospital Discharge Efficiency, Hospital In-patient Journey and Hospital Resource Usage, Child Health - Restoring Function and Safe-care & Remote Monitoring
12 (Mar 17)	4	Diagnostic and Early Triage, GP of the Future - Self Care, Workload and Demand Management

## 3.2

### ABBREVIATIONS

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COPD	Chronic Obstructive Pulmonary Disease
DNA	Did Not Attend (an appointment)
HTA	Health Technology Assessment
IAPT	Improving Access to Psychological Services
ITP	Innovation Technology Price
ITT	Innovation Technology Tariff
LD	Learning Difficulties
MHRA	Medicines and Healthcare products Regulatory Agency
NHS	National Health Service
NHSE	National Health Service England / NHS England
NHSI	National Health Service Improvement
NICE	The National Institute for Health and Care Excellence
NPV	Net Present Value
OLS	Office for Life Sciences
PROM	Patient Reported Outcome Measure
SBRI-H	Small Business Research Initiative Healthcare

## 3.3

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- **Chris May** – Mayden
- **Simon Price** – Just Checking
- **Axel Schulte** – Dynamic Health
- **Jon Shaw** – Careflow Connect
- **Sally Silva** – Nervecentre Software

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