Final report: dallas baseline economic evaluation

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Glossary of terms

Throughout the report we have adopted a range of terminology outlined in the table below:

Terminology	Definition
Independent Living Technology	Technology aimed at supporting independent living including telehealth[1] and telecare[2] products, systems, digital participation services and wellness services.
Independent Living Sector	All organisations involved in producing, distributing and promoting independent living technology, systems and services.
Customer	Anyone who makes a purchase of independent living technology, systems or services.
Gross outcomes	The immediate outcomes to individuals and businesses benefiting from actions taken by the dallas community; this does not take into account the knock on impacts on the wider economy of any actions taken by individuals or businesses.
Individual	The general population; all of which could benefit from independent living technology, systems and services whether it is to manage their own health records, or to facilitate independence from formal care.
Interoperability	Interoperability in the context of this document means the ability to exchange information and use the information that has been exchanged. It refers to services, core systems, products, and data flows. Within dallas the emphasis is on dynamic information flows around an evolving system of health, care, and lifestyles.

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[1] Telehealth has can be defined as a service that "uses equipment to monitor people's health in their own home… [monitoring] vital signs such as blood pressure, blood oxygen levels or weight". (Department of Health 2009).

[2] Telecare can be defined as a service that uses "a combination of alarms, sensors and other equipment to help people live independently. This is done by monitoring activity changes over time and will raise a call for help in emergency situations, such as a fall, fire or a flood". (Department of Health 2009).

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Terminology	Definition
Lifestyle	Lifestyle in the context of dallas is contributed by six concepts: • **Choice:** choice in terms of products, services and systems available to suit needs • **Control:** individuals ability to control their own health care and wellbeing • **Contribution:** individuals ability to contribute to the design of products, systems and services available to them • **Connectedness:** Connections and networking between individuals through real or virtual interaction • **Community:** individuals part of a community rather than living in isolation, connected to others with shared needs, interests and aims • **Collaboration:** organisations and communities collaborating together to develop and deliver products, systems and services. The aim of dallas is therefore to impact on an individual through activity which can impact these six lifestyle concepts.
Net outcomes	The impact on the economy of dallas activity, taking into account the net effects of action taken by beneficiaries. Requires assessment of impacts within the wider economy.
Retail market	The products and services sold directly by businesses to individuals.

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1 Executive summary

1.1 Introduction

A total investment of £37.3 million is being made in the UK-wide dallas programme – Delivering Assisted Living Lifestyles at Scale. dallas comprises a £19.6m investment by the Technology Strategy Board and the National Institute for Health Research, a further £5.4m contribution from the Scottish Government, Highlands and Islands Enterprise and Scottish Enterprise and additional investment sourced from the dallas communities themselves.

dallas is establishing communities totalling 169,000 people by June 2015 across the UK. These communities will show how independent living technologies, services and systems can be used to promote wellbeing, and provide integrated top quality health and care, enabling people to live independently.

The anticipated outcomes of the dallas programme are being independently evaluated and are summarised below:
1. Benefits for the individual, their family and carers
2. Benefits to systems (including, but not limited to, public and private health care)
3. Economic and business benefits for the UK.

The evaluation will be conducted in three stages; research will be conducted at the baseline, interim and final stage of the dallas programme. This report focuses on the economic and business benefits to the UK, and presents results from the first stage of the evaluation. The University of Glasgow has been commissioned to evaluate benefits to the individual and the system.

The overall aim of the economic and business benefits work conducted at this stage was to capture a baseline from which change can be monitored following implementation of dallas activity. In addressing this aim the following objectives were also identified:
- Define the independent living sector; identifying organisations which produce products, systems and services within the sector, the products, systems and services they produce and their current customer base
- Validate assumptions underpinning the programme logic behind activity planned by dallas communities; this includes exploring current barriers to growth within the sector
- Explore how those organisations see the future market and any likely impacts which may arise from dallas
- Explore how public and private sector consumers currently procure independent living products, systems and services.

Results presented for the economic baseline are based on current data; however it is the intention that as further sources of evidence become available this will be revised throughout the course of the evaluation which is due to complete in July 2015.

1.2 Methodology

The following work elements were conducted to achieve the objectives outlined above:
- A workshop with leads of the dallas community to understand the programme logic behind planned activity
- 14 sector expert interviews to provide context on the independent living sector
- 96 industry and commerce interviews and further desk research, identifying 365 organisations within the independent living sector. The interviews and desk research (e.g. mining of publicly available sources of information such as Companies' House reports) captured further contextual information and financial data
- 6 qualitative interviews with public sector consumers to understand how they see the market and determine current procedures for the procurement of independent living products, systems and services.

1.3 The independent living sector

The independent living sector involves a range of organisations and individuals including those involved in production, intermediaries providing associated services, purchasers of the technology and the end consumers who utilise the products, systems and services. Organisations currently involved within the sector view the end user target as the younger older population (aged 60-75) and those with long term conditions.

The main barriers to growth within the sector cited by respondents fall into the following categories:
- **Social** – encompassing an information market failure whereby the target market are unaware of the products, systems and services available and how to obtain them. Additionally, there is also a cultural stigma surrounding their use thought to hinder purchasing behaviour;
- **Legal/Regulatory** – this mainly comprises the difficult entry into the NHS and other public bodies responsible for the provision of healthcare, particularly for smaller organisations. The lack of buy-in by these public bodies is thought also to impact on the trust of potential consumer end-users.
- **Economic/Financial** – current technology is expensive and the budgets available to both consumer end users and public sector organisations which procure products, systems and services are limited. Additionally, finance available to producers for development of products and marketing is also limited;
- **Interoperability/Proof of concept** – encompassing coordination market failures including both the lack of appropriate standards and collaboration between organisations within the sector. Organisations also struggle to demonstrate return on investment of products, systems and services when approaching potential retailers and public sector consumers impacting on their ability to sell.

The public sector organisations interviewed varied in the budgets available to them, the types of items purchased and their chosen suppliers. However, in general these organisations were more likely to purchase from larger organisations which offer tested products which are likely to be interoperable. However, there was recognition that this

procurement behaviour may stifle innovation which they believed to occur in smaller organisations. Many of the views held by public sector consumers regarding barriers were similar to those held by those interviewed producing products, systems and services including awareness by consumers and the requirement for proof of concept. Additionally, representatives believed that many of the available technologies required simplification to make them easier to use.

1.4 Economic baseline

365 organisations were identified as involved within the independent living sector, of which 80% were private / operating for profit. The spectrum of products, systems and services produced by these organisations is broad and extends beyond just telecare and telehealth. Consequently, the estimated size of the market is much larger than previous estimates for telehealth and telecare alone.

The estimate for private organisations identified at this stage indicates turnover in the region of £650m for 2011, approximately 70% of this £650m is calculated from organisations where turnover and the proportion of business relating to independent living was captured, with the remaining 30% calculated using extrapolation techniques. A proportion of this turnover is however, likely to encompass supply chain effects.

GVA for these organisations is estimated as 49% of this figure, (based on cases where GVA could be calculated) equating to ~£320m.

Considering the third sector and public sector organisations for which turnover and proportion of activity pertaining to independent living was reported (n=9); these organisations turned over approximately £70m in 2011. In the absence of adequate evidence to estimate the contribution for those organisations where data is missing, these cases have not been grossed up to the full population of 27 third sector and public sector organisations at this stage. However given that these cases are not included it is likely the contribution by the third and public sector is larger than that indicated by the figure presented in this report.

1.5 Conclusions

The market failures identified by the communities underpinning the dallas programme logic are significant barriers to the growth of the independent living sector and have been reiterated by interview respondents (as described in Section 1.3 above).

If these barriers can be overcome, either through the actions taken by dallas communities or otherwise, sector experts and industry representatives believe that the sector will grow.

The activities proposed and being taken forward by the communities will enable consideration to be given to the extent to which the market failures can be overcome (insofar as they are specifically designed to address the significant barriers to market growth evidenced in the baseline):

- Lack of awareness (information failure) is being targeted through marketing campaigns and engagement which targets individuals and their needs directly.

Platforms are also being designed through which products, systems and services can be purchased and subjected to review.

- Interoperability is being considered across all community activity encompassing products, services and information flow. Where this is successful it will address current coordination failures preventing market growth.

- dallas communities also involve NHS partners. Statutory procurement representatives interviewed in this study anticipate that this will help to demonstrate how some of the statutory and regulatory barriers reported by industry and commerce representatives may be overcome (e.g. barriers to entry). However, whether this will be sufficient to invoke a culture change across procurement in the wider population, opening the door to smaller organisations not directly involved within dallas, is unclear at this stage.

- Similarly, the financial investment made through dallas benefits the consortium of organisations directly involved. However, whether this will encourage wider investment by UK companies is currently unclear, and will need to be monitored.

- The baseline evaluation has confirmed that there are a number of initiatives and policies other than the dallas programme that may impact on the market for independent living products, systems and services (e.g. ALIP projects, 3millionlives and Personal Budgets), and has highlighted the need for the interim and final evaluations to keep this in mind in developing a suitable approach for considering what would have happened in the absence of dallas.

1.6 Implications for the evaluation

Organisations and sector experts view the target market for products, systems and services as the younger older (aged 60-75 years) population and those with long term conditions. The focus of dallas activity is the entire population and will aim to encourage individuals of all ages to take responsibility for their own health and wellbeing. A shift in this definition or in the types of products, systems and services available at the interim and final stage of evaluation may therefore indicate impact of dallas activity.

A baseline estimate for turnover and GVA of the independent living sector has been produced. However, there are still a number of data gaps and extrapolation methods have been applied where possible to derive the overall estimate. The baseline would therefore benefit from revision as further evidence becomes available. Improvements can be made both through accessing existing research and though additional primary research (see Section 6.2). We recommend that these options are explored further prior to the interim evaluation with the Technology Strategy Board.

In addition to these methodology improvements, the baseline stage has shown that organisations are more willing to provide information when they have received confirmation of the involvement of the Technology Strategy Board within the research. Therefore any new organisations identified as contacts for latter stages of the evaluations should ideally be pre-notified. We recommend that a letter from the Technology Strategy Board is prepared for Databuild which can be sent out upon request to maximise the response rate.

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2 Introduction

2.1 Background

The Technology Strategy Board is a business-led executive non-departmental public body, established by the government. Its mission is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life.

A total investment of £37.3 million is being made in the UK-wide dallas programme – Delivering Assisted Living Lifestyles at Scale. This programme aims to bring together all the elements, activities and work streams of the Assisted Living Innovation Platform (ALIP), including activities funded by the Department of Health.

dallas comprises a £19.6m investment by the Technology Strategy Board and the National Institute for Health Research, a further £5.4m contribution from the Scottish Government, Highlands and Islands Enterprise and Scottish Enterprise and additional investment sourced from the dallas communities themselves.

dallas is establishing communities totalling 169,000 people by June 2015 across the UK. These communities will show how independent living technologies, services and systems can be used to promote wellbeing, and provide integrated top quality health and care, enabling people to live independently – including a preventative approach. The four communities encompassed within dallas and a brief overview of their activity is outlined in Table 1.

Table 1: Overview of the four dallas communities

Community	Overview of activity
Year Zero	Year Zero will establish a community of individuals linked though products and services aimed at supporting/enabling them to manage their own health. Products and services will be developed with other businesses within the consortium through a 'joint exploitation vehicle' which will be launched through the community.
Mi Liverpool (formerly known as Feel Good Factory)	The aim of Mi Liverpool is to increase levels of independence and self-care in Liverpool, supported by increased access to independent living technology on the open retail market (e.g. on Amazon, the high street and other websites). Community activists will assess potential needs of the individual, and discuss with family, friends and neighbours to improve awareness of technologies available. Provision of advice is through centres, net TV, telephone line and also installation support.

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Community	Overview of activity
Living it Up	LiU will develop a community (initially aimed at individuals over the age of 50). Using the community as a platform LiU will establish a trusted marketplace for independent living products, which will match individuals with products and services which may benefit them. The community consortium involves 12 industry partners, and SMEs in Scotland will be approached to encourage listing of services and products.
i-Focus	i-Focus comprises three layers of activity which centre on 'interoperability' both within the UK independent living market and dallas itself. The three layers of activity comprise: 1. Identifying dallas specific interoperability needs 2. Develop a process for interoperability standards generalised to UK market through stakeholder collaboration and development of an independent living kite-mark 3. Develop and launch independent living products and services for individuals

2.2 Objectives

The outcomes of the dallas programme can be summarised under three main headings:
1. Benefits for the individual, their family and carers
2. Benefits to systems (including, but not limited to, public and private health care)
3. Economic and business benefits for the UK.

This project is intended to evaluate the programme against the third outcome, i.e. has dallas produced positive and sustainable wealth creation for the UK?

An expert team at the University of Glasgow has been commissioned by Technology Strategy Board to evaluate the programme against the first and second outcomes.

The dallas communities will be running until summer 2015 and so the evaluation will be required to estimate the benefits that should accrue for several years beyond.

2.3 dallas programme – economic evaluation

The economic evaluation will be delivered in three stages:
- A stage 1 baseline which will provide:
  - An assessment of the independent living sector to consider how the market has developed over the past five years
  - Data about the current market that can be used in subsequent phases of the evaluation to draw conclusions about the impact that the dallas communities have made.
- A stage 2 interim evaluation after 18 months to measure impact to date and to provide an opportunity to review and confirm the approach
- A stage 3 full evaluation to draw conclusions about the net economic impacts of the dallas communities.

2.4 Structure of this report

- **Section 3** presents an overview of the methodology for stage 1 of the economic evaluation of dallas

- **Section 4** explores the definition of the independent living sector using evidence provided by the different work elements of the evaluation

- **Section 5** discusses the programme logic behind dallas and the main market failures and barriers to growth in the independent living sector

- **Section 6** estimates the economic baseline, drawing on insight from interviews and desk research with the industry and commerce sector; this includes organisations in the private and third sector

- **Section 7** presents the findings from interviews with those responsible for independent living procurement within public sector bodies

- **Section 8** presents the conclusions from the baseline evaluation

- **Section 9** presents implications for the evaluation and recommendations for the interim and final stages

- **Section 10** outlines next steps in the evaluation.

3   Methodology overview

3.1 Introduction

The purpose of stage 1 of the evaluation was to capture a baseline from which change can be monitored following implementation of dallas activity. The primary aim was to capture economic metrics (e.g. turnover sales, employment) covering the past 5 years for the industry and commerce sector involved in the independent living. However, stage 1 of the evaluation has also provided an opportunity to:

- Define the independent living sector; identifying organisations within the sector, the products, systems and services they produce and their current customer base
- Validate assumptions underpinning the programme logic behind activity planned by dallas communities; this includes exploring current barriers to growth within the sector
- Explore how those currently producing independent living products, systems and services see the future market and any likely impacts which may arise from dallas
- Explore how public and private sector consumers currently procure independent living products, systems and services.

To fulfil these aims three work elements were conducted, as outlined in Section 3.2 to 3.4.

3.2 Sector expert interviews

A total of fourteen interviews were undertaken with a wide variety of experts in the field of independent living technology with the aim of gathering contextual information to define the independent living sector. Amongst those interviewed were trade and industry association representatives, key academics and researchers, individuals from organisations within and outside the dallas communities, consultants, and leaders of third sector and commercial bodies.

In addition to these fourteen interviews, email and telephone communication has also been made with further contacts within the sector to identify sources of information and origin of various facts and figures cited in reviewed publications.

3.3 Industry and commerce interviews and desk research

Interviews and desk research were conducted to enable an economic baseline to be quantified for the independent living sector. In total 96 interviews were conducted with organisations within the following groups:
- 18 with businesses participating in the dallas programme from a population of 36 (excluding organisations identified in the original database as NHS and local authorities)
- 24 with businesses involved in Technology Strategy Board Assisted Living Technology (ALIP) projects from a population of 80 (excluding organisations identified in the original database as NHS and local authorities)
- 53 with stage 2 unsuccessful dallas applicants, including those which did go on to form their own projects independent of dallas from a population of 94 (excluding organisations identified in the original database as NHS and local authorities)

For all organisations within the population where possible Companies' House reports covering the period from 2008-2012 were purchased and used to extract financial data. This data was then verified during interview or used without verification where interview was not possible. In total Companies' House reports were purchased for 124 organisations from the dallas, ALIP or dallas applicant population.

Further to Companies' House searches carried out on organisations outlined above; where possible reports were also purchased for additional organisations thought to have activity within the independent living sector. These organisations were identified from the following sources:
- 31 organisations from the Government Procurement Service[3]
- 40 organisations from the TSA members directory[4]
- 84 organisations from Curry, Lethbridge, Parry (2009)[5]

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[3] Government Procurement Service - http://gps.cabinetoffice.gov.uk/suppliers/

[4] TSA members directory - http://www.telecare.org.uk/member-directory?org=all&country=all

[5] Richard Curry (SEHTA), Katy Lethbridge (SEHTA), David Parry (SEHTA); An International Centre of Excellence in Telecare Background and Development 2009

The final database therefore comprised 365 organisations. For all of the organisations interviewed or identified through external searches we have attempted to collate detailed financial data from 2008-2012. However, there are still a number of gaps, due to a number of obstacles; as outlined below:

- Financial and historical data: The interview process was successful at capturing a number of these metrics for 2011; however for 2012 and for earlier years this was more difficult. This is because it was often too early for organisations to estimate figures for 2012 and for earlier figures they needed time to acquire further figures. Data capture forms were sent to all interview respondents via email, and followed up regularly throughout the data collection period. However, many respondents failed to respond to emails and messages and did not return completed data capture forms.

  Organisations interviewed were all from the dallas, ALIP or dallas applicant pool, however there were a number of other organisations identified through desk research. Where a Companies' House report could not be found for these additional organisations we were unable to capture any financial data.

- Operating profit: The profit margin of organisations interviewed was often seen as very sensitive information and although organisations were often willing to provide turnover they did not wish to share their margins.

- Proportion Independent Living: Where figures were obtained by Companies' House but the organisation concerned was not interviewed[6] it was not possible to ascertain what proportion of their figures pertained to independent living. In these cases where possible, company websites have been visited and an assessment made, however there are still cases where this information is not available. Additionally, where this information has been derived from visiting the organisations webpage we need to assume the current level of business pertaining to independent living has been the same from years 2008-2012.

  This was also difficult for very large retail facing organisations interviewed, where the respondent could not estimate what percentage of their products sold, turnover etc. would be based on independent living.

To overcome these obstacles we have used a triangulation approach to estimating the baseline, whereby evidence from interviews conducted, existing research and financial data is combined to derive an overall estimate of the market in terms of turnover and GVA. For operational information and R&D spend, metrics are reported for those organisations interviewed, however as is the case for turnover, organisations often found it difficult to report these figures.

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[6] This comprised dallas community, ALIP or dallas pool members which we were unable to interview and those organisations found through desk research for which an interview was not attempted.

This report also includes a section outlining suggestions for strengthening the economic baseline, which following discussion with the Technology Strategy Board we intend to take forward at the interim and final evaluation stages.

3.4 Qualitative interviews with the public sector consumers

One of the underlying assumptions expressed by communities is that technology producers currently predominantly sell to organisations; and consequently an aim of the dallas programme is to encourage sale on the retail market to the individual. Activity undertaken by dallas may therefore have an impact on public sector behaviour. To understand potential impact at the interim and final evaluation stage, 6 interviews were conducted with public sector consumers of independent living technology. Interviews conducted can be broken down as follows:

- 4 procurement representatives from the NHS
- 1 Housing Association procurement representative
- 1 City Council procurement representative.

3.5 Limitations

The primary limitations associated with the baseline evaluation are surrounding quantitative economic figures (e.g. turnover, GVA, number of employees) and are outlined below:

- There may be a number of organisations which were not covered when capturing economic data; to alleviate this we will endeavour to continue to identify organisations within scope at the interim and final (stages 2 and 3) evaluation and where required update and revise the baseline. Additionally, this report identifies further sources of information which would improve the database of organisations.
- The availability of economic metrics for each organisation differed; this report therefore uses extrapolation to estimate the impact of these organisations within the market.

4 The independent living sector

4.1 Defining the sector

To define the independent sector; the types of organisations within the independent living sector were explored with experts, but also confirmed through provision of dallas and ALIP project databases and further conversations with industry and commerce representatives. The types of organisations/individuals and how they are related is outlined in Figure 1.

Figure 1: Types of organisations/individuals within the independent living sector according to sector experts

Type of organisation		Description
Producers:		
	Technology based organisations	Tunstall, quoted by most sector experts as the dominant player; numerous small start-ups with very innovative high-tech solutions; established companies with smaller shares include Tynetec, Chubb and Bosch; also BT, O2, Microsoft etc, who are beginning to get involved on the communications front.
	Telecare producers	A significant growth area in the last 5 – 10 years, relatively low-tech and run either by Tunstall (estimated by sector experts to have 70-80% of the market) or small-scale local third sector organisations.
	Telehealth producers	Mainly call centres operating at regional level on a disease-centric basis. One sector expert stated that there were about 20 organisations supplying this market, the biggest ones being Bosch, Philips, Tunstall and GE Care Innovations.
	Universities	Although not often directly producing products, systems and services universities conduct research into the market and into product development.
Intermediaries:		
	Service based organisations	Companies involved in care provision, e.g. BUPA, PPP, Anchor and many others, with possible new entrants from the fitness sector.
Purchasers:		
	Statutory	Local authorities, commissioners in social services, care homes, PCT/CCGs
	Third sector	Care homes, charities, housing associations, extra care housing, some telecare operators and some membership organisations representing people living with long term health conditions.
	Retail	Very little activity here so far, with disability aids shops, Boots and Lloyds being the most active, but home/DIY stores poised to enter. B&Q was often quoted as being the main retailer that has started to stock very basic products. There is little call from end users yet for anything except the most unsophisticated technology. Consumer purchases estimated at around 5% of total sales.
End consumers:		
	Individuals/ carers	Members of the population who purchase independent living products, systems and services - either for those they are caring for or for themselves.

The dallas spectrum of activity encompasses the entire population within its target market; and will focus on those without long term care or health needs thus encouraging them to manage their own health and wellbeing. Each of the respondents was therefore asked how they themselves would define independent living. In general, most organisations described this term as enabling individuals to remain independent within their own home, but their responses focused on the aging population or those with long term health conditions:

> *"Where people are able to live their life by their own means if possible and not need to access services and NHS resources, and still have a good quality of life."*
> *"To enable older people to live a more independent existence and avoid going into care and being supported full time by social care."*
>
> *"Someone who lives in their own home with minimum support, may have some support (e.g. meals on wheels etc), but basically people who live on their own independently, might be in their own home or might be a sheltered environment."*
> *"People can live in their house longer than they would normally. They don't have to be put into a home or hospital due to the help of technologies allowing them to live longer in their own home."*
>
> *"I call independent living anything that allows somebodies cognitive, functional, and emotional or any other decline to be compensated or to be restored to the extent that it can. Being in the community and not being lonely - loneliness is a big contributor to health."*
>
> *"To me it just means allowing and supporting people, whether it is an elderly person, someone with disabilities or complex needs to live independently or in a kind of homely type setting for as long as possible. It's really just preventing or delaying admission into any kind of hospital or care setting."*
> *"This relates to a person that doesn't have mobility or doesn't have much self-independence, they can basically use technology to do what they want to do with minimum assistance."*
>
> *"Independent living is a lovely term. I see it as somebody who lives in a dwelling in their own space with some elements of support. People are able to live independently, rather than in a care home, but they also have access to means of support when they need it. They may have access to a vast amount of telehealth and telecare products but they are still living at home."*

A few respondents interviewed did appear to have a broader view of the market, however there was still often some focus on the target market reaching a point where they could no longer be independent before take-up of available products, systems and services. Additionally, one respondent who did have a similar vision to that of dallas did not believe that these were the view of the Technology Strategy Board:

> *"There's an equally big market for people who want support in their life. In sheltered housing, there's a surprisingly large age range. People are moving into this housing in their 50's because they don't want to deal with stress of having to run their own life in rented accommodation. There's an interested market there in how you use assisted living technologies for people typically living alone, looking for ways of making their life less stressful. It struck us in the trials we put out; quite a lot of assisted living has nothing to do with people with long term conditions. To me, this starts to smear the spectrum, you look at products like jar openers and the like, which are just to help people. I think assisted living starts there. It's a lot lower tech than people think."*
>
> *"It's not necessarily about a medical market, some have long term conditions, but if you design assisted living products properly then they can be used by a lot of people. It's not necessarily about treating long term conditions it's about making life independent."*
>
> *"I understand it in a much broader way than TSB, engaging an entire population and making them more responsible for their own health and making them more involved in their route to wellness. [You need to] take a much broader philosophical approach."*

4.2 Scale and state of the sector

In terms of scale, numbers quoted by sector experts and industry and commerce respondents were often diverse. This is largely due to the range of products, systems and services their expertise covered, however analysis of these responses is provided below.

Most industry and commerce representatives found it very difficult to numerically quantify the UK market and were more comfortable describing it qualitatively with terms such as 'large'. Additionally, a few respondents were aware of statistics for the United States but not for the UK. Of those interviewed who were able to quantify the market, this was either an estimation of how large the potential market was or how large the current market is. Estimates provided by respondents are summarised in Table 2. As indicated below, many of the responses are within similar orders of magnitude and can often be traced back to existing research and published sources.

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Table 2 Market size estimates provided by sector experts and industry and commerce representatives

Indicator	Current market size	Potential market size
Number of homes	• None provided	• 3.5m households occupied by individuals who are single and over the age of 50 • 6m households where an occupant could benefit from some form of independent living technology which could result in sales of around £35-£55 per household per month.
Number of people/ individuals	• 350+ members of Telecare Services Association; with 1.7 million people currently using independent living aids[7] • 1.6 million using pendant alarms (classified as a telecare product) • 5-10,000 using currently using telehealth services	• Between 10-15 million people; as cited by one respondent this figure is confirmed by the Department of Health as the number of people living with long term conditions[8] • The Department of Health estimate that telecare has the potential to prevent 160,000 people being in residential care a year with cost savings of £2bn a year • Respondent cited the Health and care infrastructure research innovation centre which has carried out specific research on the numbers - the potential remote care market in 2010 was 1.4 million reaching 3.2 million in 2050[9]
Value of the market (£s)	• 70% of NHS spend is on people with long term conditions[10]; so it is something like £70bn. • Half a billion pound a year turnover in the whole independent living sector • 6000 people are using telehealth within the UK at an average cost of £50-£500 per year; this would therefore equate to a market size for telehealth of between £300,000-£3m	• £15bn over the next 15 years • Other responses ranged from £500m for telehealth to £7billion for the care market as a whole

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[7] Confirmed by information provided on the TSA website: http://www.telecare.org.uk/

[8] Confirmed by the Department of Health website: http://www.dh.gov.uk/health/category/policy-areas/nhs/long-term-conditions/

[9] Confirmed in the report 'Developing the capacity of the remote care industry to supply Britain's future needs':
http://www.haciric.org/static/pdf/publications/HaCIRIC_%20Remote_Care_Report_061212.pdf

[10] Confirmed on the NHS Direct website:
http://www.nhsdirect.nhs.uk/en/Members/MembersMagazineArchive/TogetherWinter2011-12/LTCs

Most sector experts thought the sector had consolidated and become somewhat more organised in the last five years, with a clearer strategic direction at national policy level helping to guide activity. There has been more outsourcing, some collaboration amongst medium sized companies, and bigger organisations buying up smaller companies. But generally, people still describe the sector as fragmented, "incredibly difficult to work in", with no one organisation big enough to take the market in the direction that it needs to go. On the demand side, it is viewed as still very disorganised and inflexible.

Almost all sector experts talked of the sense of "waiting" for growth to happen. This has, apparently, been the case for at least two decades, but the market really has not picked up any significant speed yet. There has been a growing and now widespread awareness and acceptance of the potential for technology to help people live independently, but a failure to adopt in any scale. This is put down mainly to regulatory/structural and social/cultural problems, discussed further under barriers in Section 5. Respondents were all quick to point out that the problem is not the technology itself, but the attendant changes in systems and ways of working which would be necessary to get it put in place. "The problems are structural not technical" was a common comment.

Sector experts did believe the technology itself is moving swiftly towards being more intuitive, more user-friendly. Future products and services will be based on smart phones, tablets and the internet. It was mentioned several times that much more attention is being paid in the last few years to ensuring that developments respond to user need rather than being nice ideas without realistic applications, however these changes do not appear to have yet transpired into sales.

> "Technology is less important to reducing potential barriers. The key concern is the take up of existing technologies and human factors on how the product is not a service and how it has been designed with the end user's needs in mind during the design process. Someone would identify a gap where there is a need and go ahead and build a product, but if people (the end users) aren't happy with it for reasons of trust or security issues and the conscious thought of the end user of 'what will others think if I'm wearing it', then this new development will not be accepted by the user themselves."

The majority of organisations interviewed believe the market will grow over the next few years or believe that there is potential for growth providing key barriers (described in more detail in Section 5) are overcome. In line with definition of independent living, respondents often attributed anticipated growth to the aging population.

> *"I definitely see the independent living market growing as people are getting older and older and living longer and want to remain independent longer- which is what the government wants too."*
>
> *"The independent living market is going to rapidly increase as we have an ageing population, there is an increase of diseases, an increase in long term conditions, which people have more than one of, and a decrease in people informally looking after people."*
>
> *"We expect it to grow – there a number of pressures that will force it to grow including the growing costs of healthcare for the aging and people with long term conditions that will necessitate growth."*

Smaller companies appear to be of the opinion that widespread growth of the market is unlikely to be achieved until the larger companies operating within the independent living market take the first step and lead from the front.

> *"I don't see any change at all mainly as the market is dominated by a couple of large players and they will dictate the speed in change and they don't want it to change at the moment because if they go to a standards based solution then other people would be able to come into the market easily. They would have to release their monopoly, which they don't want to do."*

Some companies find the NHS and the statutory sector are a real obstacle in terms of growth because the current framework that the NHS employs makes it very difficult for small companies and start-ups to break into the market. This is explored in more depth under Section 5.2 Legal/regulatory barriers.

> "*Probably the size of the NHS because it is so much of a 'big beast' that it makes it really difficult when people are at the cutting edge of technology and the big players are not moving with time.*"
>
> "*I think it's going to move slowly. Despite all of the doomsday warnings about aging, there's still going to be considerable involvement from NHS and local government in provision of this and they operate at a glacial pace whether we like it or not.*
>
> "*The market will grow but it's very much reliant on the public sector at the moment and until we bridge the gap between products and the mass market – it will still be difficult for providers.*"
>
> *Our major barrier is the ability to sell directly to the NHS through the 'NHS buying solutions' programme, which is the only way to sell products onto the NHS.*"

4.3 UK performance

Most companies manufacture in the UK but source components from China and Korea, which are far cheaper, though some products are completely manufactured in the Far East, with only the design and development taking place in the UK.

> "*A lot of device manufacturing happens overseas but software development often happens in the UK.*"
>
> "*Generally we don't manufacture ourselves; we source components from the Far East.*"
>
> "*We source materials and components from all over the world, mainly from China, America and Japan.*"

In general, the UK is regarded by sector experts as pretty good at having innovative ideas and creative solutions, but less effective at implementation, at least partially because UK companies involved tend to be considerably smaller. The result is that other countries – Scandinavia, Netherlands, Singapore, Ireland and Israel, along with the US care for veterans – are pulling ahead. Because they will have tried and tested products and services well before the UK does, respondents felt that the UK is now at a potential disadvantage in the world market.

One sector expert viewed the UK as good at building on the innovative ideas from academic organisations and making them more commercial. Some thought the UK was competitive but falling behind on product development (because the market is not big or profitable enough to sustain investment in this area) and price (too high due to not being

deployed at scale). One respondent described the UK as very weak in comparison with the rest of the world.

> *"Having worked overseas I have found that this market is huge elsewhere...in the UK, because the NHS will do everything, our market is very far behind."*
>
> *"The UK is a difficult and atypical market because of the sheer influence, size and buying pattern of the NHS. That may make it more difficult for UK companies elsewhere and that's a shame for the UK as there a lot of innovation here."*
>
> *"Initiatives like dallas have been going on in America for years"*

One sector expert also thought the UK's problem was that there is not one single organisation controlling cost. Abroad (for example in the US), insurance companies are taking an interest because they control the costs and want to reduce them. This opinion also further validates the emphasis organisations have on the market being centred on those with healthcare needs.

5 Validating programme logic

A programme logic was developed for each of the communities following consultation at the dallas leads meeting on the 8th October 2012. The programme logics developed for each community are included in Appendix 1 of this report. Overall, members of the dallas communities cited the following primary market failures which give rise to the need for dallas activity:

- **Information market failures**:
    - o Individuals are often unaware of independent living products and services because technology companies currently tend to sell their products systems and services to organisations in the public sector rather than directly to individuals/carers;
    - o Where individuals are aware of products and services there is a lack of trust in products available because there is little endorsement, review or trusted standards;
    - o Given that a large scale market selling directly to the individuals has not been established, there is no proof of concept to give organisations the confidence to invest in this market within the UK.
- **Coordination market failures**:
    - o Independent living services, core systems, products and data flows are not currently interoperable. This has stifled the large scale roll out onto the retail market.

Activity delivered by dallas communities has therefore been designed to address these needs in a number of ways. This includes innovative methods for engaging consumers, partnerships with statutory service and development of accessible products, systems and services. Community activity will also work on the trust element both through platforms

that allow review and recommendations but also through the overall aim of ensuring work carried out by dallas is drawn together. This is a particular aim of the i-focus community which aims to ensure that interoperability is at the forefront of work carried out by dallas.

Existing studies, such as the Whole System Demonstrator[11] have shown that telecare and telehealth products and services are cost neutral or better for the public health and care service and can reduce mortality rates. There has been an interest by both government and non-government organisations in initiatives to provide telehealth and telecare to the individual[12]. These initiatives have largely targeted those with long term conditions. Communities believe that for UK companies and economy to benefit from this change they must engage early on to ensure that international competition does not dominate both the UK and global market. If the UK can stay ahead of international competition, there is more opportunity to gain a share of the global market. One aim of dallas is therefore to provide an opportunity for companies to test products and services at scale before launching internationally. This also helps address the information market failure whereby there is little evidence or proof of concept that there is an independent living market.

Both sector expert and industry and commerce representative interviews were used to validate these assumptions and to capture additional barriers to sector growth. Respondents were asked to communicate barriers and obstacles unprompted but then also prompted within the areas outlined in Figure 2.

Figure 2: Categories of barriers for growth and for breaking into the retail market explored with respondents

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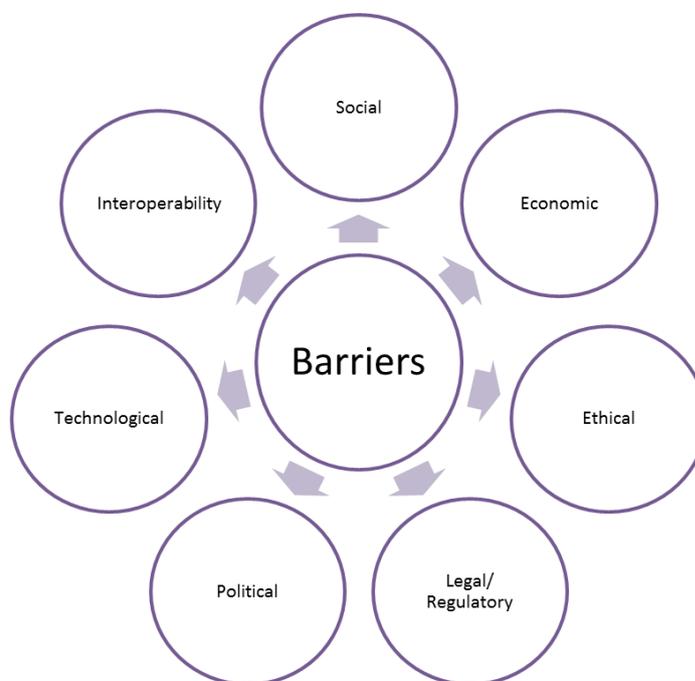
[11] Department of Health- *Whole system demonstrator - Headline findings December 2011*:
http://www.dh.gov.uk/health/2011/12/wsd-headline-findings/
[12] European Commission - *E-health 2020*:
http://ec.europa.eu/health-eu/care_for_me/e-health/index_en.htm#

There were a number of organisations that did not feel there were any barriers to approaching the retail market. These organisations mainly comprised larger retail facing organisations which often had a broader focus to their activity (i.e. independent living was only a fraction of activity). Additionally, a few charitable and third sector organisations providing services and information did not feel that there were any barriers. However, most organisations did cite at least one. Generally these barriers were social, legal/regulatory, economic or related to interoperability as described in more detail below.

5.1 Social barriers

Lack of awareness of products, systems and services available to individuals was the most commonly cited social barrier by sector experts and industry and commerce representatives. This corroborates the information market failure identified by dallas community leads. Additionally, where individuals are aware, they often do not know the best place/outlet in which to purchase what they looking for. Sector experts believed that even the professionals did not know how to obtain or use the assistive technologies.

> *"People just don't know what is out there and the mechanisms for finding them, like websites, are very limited and don't help people identify what they need."*
>
> *"The main barrier is social awareness for our products and services and trying to get our services out to the demographic cohort in need of it"*
>
> *"...we would require a large marketing campaign to reach and educate the end user which would cost a lot of money."*
>
> *"The major barrier for the growth of the market is the lack of consumer awareness about products and services. There is a general lack of information."*
>
> *"One of the issues that springs to mind is accessing people. A lot of people who need help are isolated... people are astounded by what the technology can do but they can't afford it or think they can't afford it."*
>
> *"We need to see these products used naturally on television, almost as product placement, so people become aware of the benefits and the low cost."*
>
> *"When it comes to carers and families, I think it really is a lack of awareness in terms of assisted living technologies. It's really about us trying to work with GPs and carer centres to increase the information that people receive and make them better informed.
> Not everyone is comfortable using technology, so there is an issue with giving people adequate training to use these packages - we don't have the resources to go out to families etc to train."*

Additionally, respondents were also keen to highlight the stigma behind assisted and independent living products, systems and services. This feeling was also echoed at the Co-

Modal[13] dissemination event; whereby those conducting research for the project believed that large retailers were reticent to stock products due to the negative connotation associated with assisted living technology. In particular, experts believed this has resulted in a lack of attention paid to the design of these products thus making them less aesthetically attractive.

> "*...there is a stigmatisation of assisted living technologies and a stigma behind accepting the need to use them.*"
>
> "*Admittance from an individual that they need to use assisted living technologies, the individual may feel that they are accepting a weakness in themselves (perception amongst consumers. Admission of weakness is no delight. Therefore there is no sense of pleasure or delight in using them.*"

5.2 Legal/regulatory barriers

It is perceived as very difficult to get any changes made in the health service, with entrenched attitudes and unhelpful targets being significant obstacles to progress. Respondents talked of the frustration of manufacturers at how slow-moving the health service is, and described the medical community as very conservative and reluctant to change. Furthermore, a sector expert remarked that the NHS is very fragmented and is not one single organisation but hundreds of smaller bodies which contributes to the difficulties faced. This applies to other organisations involved also, though to a lesser extent. Those interviewed were also keen to mention that addressing this barrier and gaining NHS buy-in would help to instil trust within consumers.

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[13] There are a number of Technology Strategy Board projects with an economic evaluation facet. Co-Modal (Consumer Models for Assisted Living) is aimed at understanding the barriers to market development and identifying scalable workable solutions.

> *"The NHS is the most conservative series of organisations ever."*
>
> *"The issue is not product based; it is about getting the statutory sector to adapt."*
>
> *"It's not about the products and services, it is about reorganising the statutory sector, getting them to change the way they approach things – this has been seriously underestimated."*
>
> *"Big retailers tend to copy the NHS. If the NHS are using it then they are happy to take it on board, otherwise they are a lot more reluctant."*
>
> *The NHS is the main barrier. They have an inability to innovate, or take any idea that isn't widely supported by a strong evidence base. They are unwilling to invest in products and services that do not have evidence to prove their use.*
>
> *"It's still a relatively new market; the main barrier is the procurement aspect. Procurement is often very prescriptive when it comes to public sector organisations."*
>
> *"People don't actually know that the services exist, we market ourselves but people really don't understand what is being offered and lack of referrals from statutory sector to us - more inward looking GP's generally take a more clinical look at a medical model rather than a community based support would."*
>
> *"I deal with barriers in the NHS as the NHS is not geared to make maximum use of technological uses because of social (lack of knowledge) and legal reasons. It is frustrating to new market entrants as there is a mismatch of what it says in policy surrounding independent living and reality on the ground."*
>
> *Our major barrier is the ability to sell directly to the NHS, through the 'NHS buying solutions' programme, which is the only way to sell products onto the NHS. The NHS are currently closed to accepting any new venders.*"

5.3 Economic/financial barriers

Economic/financial barriers were commonly cited by those interviewed and fell into a range of categories including:

- Budgets available to the consumers;
- Public sector spending budgets
- Budgets available to technology producers themselves.

The cost of many independent living products was thought by both sector experts and industry and commerce organisations to be very high. This was partly due to the current size of the market whereby products were not being produced at a large enough scale to reduce cost. Additionally, sector experts feel that there is much uncertainty in the sector,

particularly over the likely effect of Personal Budgets[14]. This seems to have affected the growth of a private market, which now only really exists amongst the better-off.

> *"One of the issues that springs to mind, is accessing people. A lot of people who need help are isolated... people are astounded by what the technology can do but they can't afford it or think they can't afford it."*
>
> *"Main barrier is the cost, people's personal budgets and their needs in terms of monitoring. If you can get the volume up you can get the cost down. Generating volume brings costs down. Wireless blood pressure may cost £80 at the moment, if produced in much higher volumes it may only cost £20."*
>
> *"If we can increase our demand then this would help further drive down the cost of products through the higher volumes produced."*
>
> *"People don't want to put their hands in their pockets if they don't know what the benefits are going to be".*

Because of the system of budgets within public sectors, it is hard to allocate funding for preventative work, since the return on investment comes back to a different budget. For example, investment in helping an older person to stay at home longer and not require hospital treatment returns a benefit to the health service, not to the local authority which funded the support. This "silo-working" was referred to frequently as a major barrier. This has resulted in most of the use of technology at present being undertaken at crisis level, rather than preventatively, which means that much potential is being missed and opportunities are not being exploited. When mentioning public sector budgets there was further mention of the need for training for people to use technologies as discussed under cultural barriers.

> *"Available finance from health and local authorities and their ability to train people how to use appropriate assisted living technologies."*

SMEs within the sector often cite finding finance themselves as quite difficult which hinders their ability to expand and enter the retail market.

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[14] Personal Budgets Legislation: http://www.parliament.uk/briefing-papers/SN03735

> *"…..economically we are in very difficult times there isn't much in terms of funding to support innovation at the moment or not as much as there should be. Given the nature or complex state of flux the industry and many service providers are looking to survive rather than development."*
>
> *"Another problem is being an early stage SME, it all comes back to a lack of money, time and resources."*
>
> *"Capital is one. We are at the stage where the product is there, we just need the marketing operations to take off."*

5.4 Interoperability/proof of concept barriers

Although not always described as 'interoperability' many respondents felt that they could not demonstrate that products, systems and services were trustworthy or that they had adhered to standards. Community leads expressed the view that addressing interoperability barriers through developing a standard for independent living would help with the market failure whereby individuals and retailers did not trust products available to them.

Sector experts reported that technical interoperability was not often the main barrier but often cited structural interoperability. The technical issues can be solved, but the cultural difficulties in getting organisations to work together and provide a seamless, joined-up service appear to represent enormous barriers. This seems to stem from when companies first entered the market, which at the time was very underdeveloped, and little was known about the market as a whole from an individual's perspective. It was suggested that projects such as those within the ALIP and government initiatives such as 3million lives are now helping to bring the market together and increase awareness of other players in the sector.

Interoperability

"There are some barriers that are technical - some of the aspirations are very easy to state in a conference or discussion table, but to make it happen in a serious way in a way that is through a responsible system that is really sound and works reliably as a service."

"Inter disciplinary collaboration. To create sophisticated projects will take a lot of expertise and knowledge and so an obstacle may be the engagement of various disciplines."

"Lack of meaningful standards is a huge barrier. Most of the people in the assisted living space have multiple conditions and that is something people need to consider. People don't just want a box that deals with one condition (a "silo system"), they want something that is multi-purpose. I think people need to realise that before anyone can grow substantially."

"What's become very clear is that current systems are far too expensive, particularly health systems. You have to look at 'how do we create a platform but how do we ensure its cost effective'? That was the other aspect of our work. We're trying to simplify system design so that you can end up with a single system that manages the patient as that's less expensive. If you keep having to add a new system to manage a new aspect of a condition, it's cost grows. Some of the separate systems like telehealth and telecare are too expensive on their own anyway so you have to look at how you integrate these platforms into a single system"

The need for standards was also strongly related to a key economic barrier whereby in addition to having a trusted brand, organisations require proof of concept to promote products, systems and services. Organisations believe that these standards are required both to demonstrate return on investment when retailers choose to stock independent living products, but also to prove their efficacy in selling to consumers and statutory customers. One sector expert has also remarked the high level of research carried out by universities contributes to the general feeling that independent living is not a market ready sector.

Proof of Concept

"In terms of the regulatory issues, selling something that is designed to safeguard vulnerable people, there are still critical issues of what happens if the system fails, regulatory and ethical issues."

"[The main barriers are] demonstrating the benefits of the system to the end user or the health professionals. Understanding the business case and finding stakeholders."

"There is not enough evidence, demonstrations or results so people discount it, which you can really see reflected in the size of the telehealth market. You can't just try telehealth products/services on 50 people and if they don't die you use it- it has got to be tested in a laboratory, tested on animals, then on thousands of people who all need to be monitored for some time afterwards."

"There is inadequate evidence of good results and the public and professionals are not yet convinced of the value of technology in this field. What is needed is big scale track records and case studies and this will only happen once independent living technology is operating at scale."

"The stronger the evidence for the benefits of these products, the bigger the market will be."

Respondents were also asked if they currently were aware of any standards which applied to the independent living market or if they currently adhered to any. Generally, respondents did not feel there were any specific standards, with some citing this as one of the current problems within the market. One key exception was those producing products classified as medical, which needed to comply with the 'Medical Devices Directive[15]. Additionally, some organisations did quote the Telecare Services Association (TSA) accreditation and cited more generic/broad standards such as the Data Protection Act and ISO standards (e.g. ISO 7000 which covers graphical symbols for use on equipment).

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[15] Medicines and Healthcare products Regulatory Agency:
http://www.mhra.gov.uk/Howweregulate/Devices/MedicalDevicesDirective/index.htm

6 Economic baseline

6.1 Profile

In total 365 organisations were identified as being involved within the independent living sector. Of these organisations three were confirmed to have never traded within the research period of 2008 through to 2013 and one had decided not to engage within the sector after an unsuccessful dallas bid. The remainder mainly comprised private sector organisations operating for profit, as shown in Figure 3.

Figure 3 Breakdown of organisations within the independent living sector identified at the baseline stage (n=361)
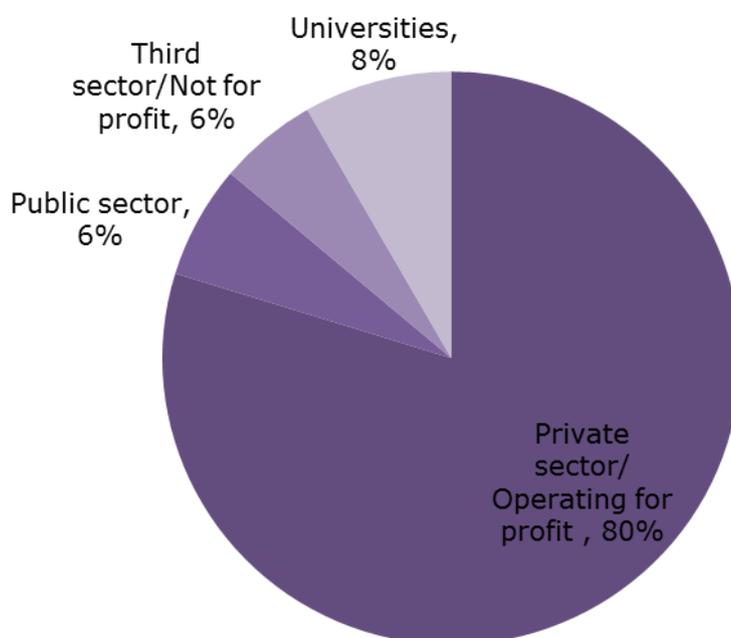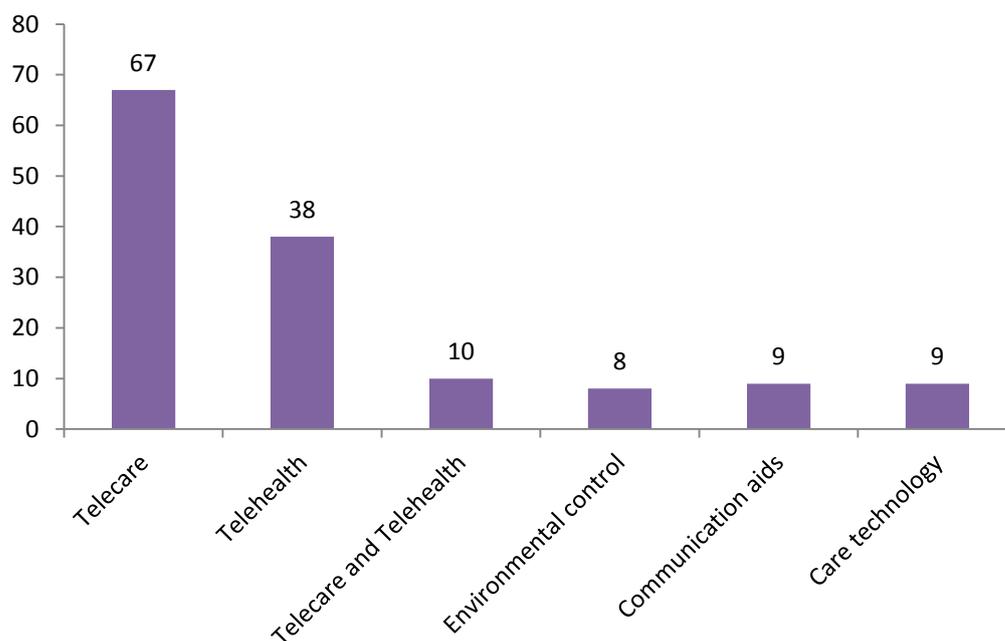

The number of private sector organisations identified here is within a similar order of magnitude to the number of organisations identified within existing studies. The Assisted Living UK opportunities and Capabilities report[12], identifies 141 private organisations selling telehealth, telecare, environmental control solutions for the home, communication aids and care technology in England, Northern Ireland, Scotland and Wales (Figure 4). Similarly, a report sent through to Databuild by one of the sector experts produced by the South East Health Technologies Alliance (SEHTA)[16] in 2009, identifies 123 private sector

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[16] Richard Curry (SEHTA), Katy Lethbridge (SEHTA), David Parry (SEHTA); An International Centre of Excellence in Telecare Background and Development 2009

organisations within the UK telecare market.[17] Although, the number of private sector organisations identified as part of the baseline is larger (n=288), this is likely due to the extended definition of the market which includes not just assisted living but independent living products, systems and services. However, accessing databases compiled for some of these existing studies and cross-referencing would increase confidence that all relevant organisations have been included (discussed in further detail in Section 6.2).

Figure 4 The number of private sector assisted living technology organisations identified in the Assisted Living UK Opportunities and Capabilities report (originally sourced from Medilink UK).

Where possible, the date of incorporation was captured for organisations interviewed. In total this was captured for 89% of private sector organisations. Approximately two thirds of organisations had a date of incorporation after the year 1995, as shown in Figure 5.

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[17] As determined from surveys conducted by the University of Southampton. This report also contains an appendix of organisation names and was therefore used to identify businesses for which Companies' House reports could be sourced to inform the baseline presented within this report.

Figure 5 Breakdown of private sector organisations by date of incorporation (n=256)
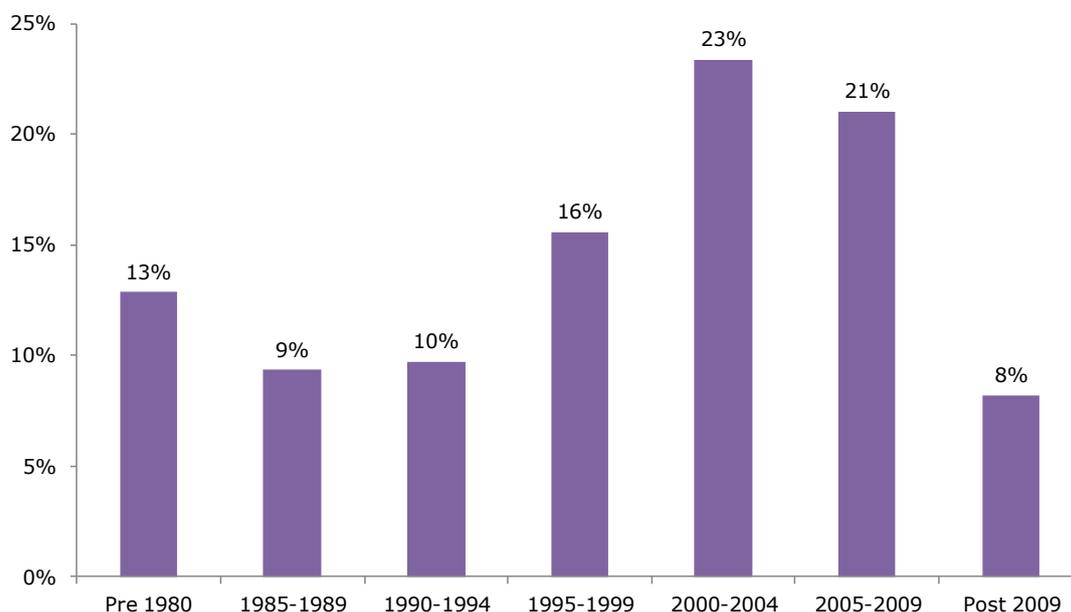
The number of employees within organisations was obtained for 79 private sector organisations. The sample covered a wide range of private sector organisations by employee size, with just under 40% of the sample operating with over 250 employees. Organisations operating with between 50 and 250 employees comprised under a third of the sample (28%) and those with less than 50 just over a third (34%). Employee size was also captured for 8 third sector and 4 public sector organisations interviewed. The size distribution of third sector organisations was evenly split between the three size categories whereas the majority of public sector organisations were large (250+ employees).

6.1.1 Financial data and operational data

Both existing research and responses from organisations interviewed regarding the size of the independent living market focus on telecare and telehealth. These markets can be estimated using information on the number of individuals that use telecare and telehealth within the UK, the cost of the services and systems provided and the Companies' House accounts for organisations which have the greatest market share.

An estimate of the market considering the largest organisations producing telecare is shown in Figure 6. This estimate draws on information provided by sector experts on the major players within the market and the financial information captured for these organisations. The estimate is segregated into hardware providers and service providers, which were often described separately by respondents.

Figure 6 Estimate of the telecare market size based on Companies' House reports of major contributors to the UK market (2011).

Telecare hardware providers	Telecare service providers
Thought to comprise a small number of organisations 2 major contributors to this market with a combined turnover of approximately ~£74m and profit equating to ~£28m	3 major contributors to this market (based on interview responses), one already captured as a hardware provider. The additional two have a combined turnover of ~£12m and profit equating to ~£3m. These two organisations are thought to have between 20-30% of the market, with the additional hardware provider making this proportion up to 50%. The remaining market is thought to comprise smaller organisations. Extrapolating these values to the full 100% provides an estimate of ~£58m.
Telecare market (based on major market contributors) **Turnover ~£132m**	

In May 2010 between 1.6 and 1.7 million people were estimated to have benefited from telecare and telehealth technology[18]. The majority of these individuals were telecare recipients with interview and sector expert responses indicating an estimated 6,000 utilising telehealth. Drawing publically available data together on the number of individuals benefiting from telecare to derive a market estimate is more difficult than doing so by estimating from accounts of service and software providers. This is due to a lack of information on the number of new individuals using technology each year and the breakdown by product and service type. However, information collated at the baseline stage is presented in Figure 7.

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[18] As reported by a number of interview respondents, referenced on the TSA website and within Whole System Demonstrator Action Network briefing paper (Mike Clark, Nick Goodwin; Sustaining innovation in telehealth and telecare, WSDAN briefing paper 2010). According to sector experts this figure was extrapolated by figures produced by the TSA in 2005.

Figure 7 Telecare market size based on the number of individuals using telecare in UK (2011).

Telecare hardware provision	Telecare services
It is difficult to place an estimate on this given that the estimated current 1.6-1.7m individuals using telecare will have purchased equipment over a number of years. However this estimate is based on extrapolating from the 1.4m published by the TSA in 2005.[18] Assuming that the number of users has increased in a linear trend to reach 1.7 million users since 2005, we estimate that the number of new individuals purchasing equipment in 2011 could be around 60,000. Basic home monitoring equipment costs are estimated at £350-£400 with an additional £100 installation charge.[19] This would generate revenue of £6m. Additionally, there will be sales from upgrades, public sector spend and replacement purchases.	It is estimated that telecare services are supplied at an average cost of £5-10 per week to the individual. Applying this to the estimate of 1.6m to 1.7m users suggests that service providers should be turning over ~£620-660m. This is much larger than suggested by the estimate outlined in . However, it is unclear whether all users will be paying for a subscription/ service and the extent to which services are provided within public sector organisations such as the NHS or local authorities.

A similar estimate can also be derived from telehealth, where there are thought be 6,000 users at an average cost of £50 to £500 per year. Although this is quite a broad range, this gives the market a value of between £300,000 and £3m. Assuming the top end of this estimate combined with the figures outlined in Figure 6 increases the value of telecare and telehealth market to £134.8m.

However, the independent living market comprises not just telecare and telehealth but a wider spectrum of products, systems and services enabling individuals to manage their own health and wellbeing. Of the population of 288 private sector organisations in 2011 (the year for which the most complete data was available); 274 were included for analysis with 7 removed as they were dissolved by this date and 7 were registered as dormant. In total turnover was available for 117 (43%) of the organisations listed. However, this includes large organisations which span multiple sectors, where total turnover will not always comprise independent living activity. Consequently, their turnover equates to over £54 billion. Considering the organisations for which the component pertaining to independent living is known (n=37), turnover equates to £480m. Despite not encompassing all the organisations within the population, this figure is nearly four times larger than that estimated for telecare and telehealth alone. This difference is largely due to the range of products, systems and services provided by organisations identified, such as IT administration systems for the NHS, advisory services and training courses. We can therefore attach a minimum estimate of the independent living market at this value, and extrapolate for the remaining organisations. The overall estimate is provided in Table 3, and is colour coded to give an indication of the confidence we can place in each estimate.

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[19] James Barlow, Steffen Bayer, Richard Curry and Jane Hendy; The costs of telecare: from pilots to mainstream implementation 2007: http://www.pssru.ac.uk/pdf/uc/uc2007/uc2007_coststelecare.pdf

The figures presented do not however take account of supply chain effects which may contribute to the overall turnover figure presented.

Table 3 Total turnover estimate by organisations within the independent living sector in 2011

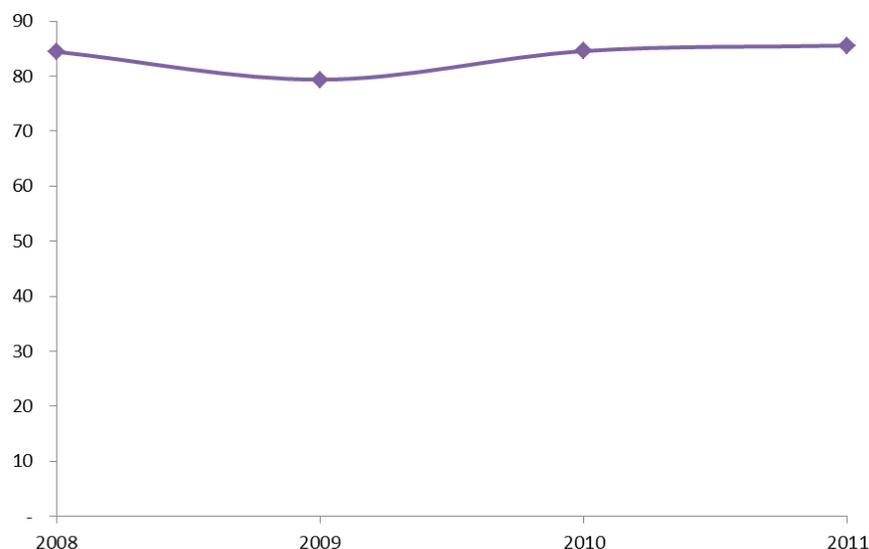| Category	Turnover	n	Confidence
Organisations where turnover and independent living proportion known	£480m	38	High
Organisations where turnover is known but proportion of business pertaining to independent living is not known. This includes very large organisations which span multiple sectors (e.g. BT, Samsung, Microsoft). Applied the proportion reported by a large organisation of similar magnitude also interviewed.	£30m	79	Medium
Organisations where turnover not known – usually unknown due to small business exemption. The average turnover pertaining to independent living of those organisations where turnover is known and under £6.5m is applied (based on 28 organisations)	£140m	157	Low
Total ~£650m for 274 organisations			

GVA can be calculated in full for 12 cases in 2011. On average GVA equated to 49% of turnover[20]. This is in line with figures published by the Annual Business Survey 2010 for service based industries, where GVA equated to approximately 48% of turnover[21]. Applying this ratio to the total figure outlined in Table 3 gives GVA as 320.6m for the independent living sector. It is recognised that where organisations are vertically integrated in the chain, this ratio may be different. However, it is not possible with the current available data to adjust for this.

Monitoring the historical trend in major contributors to telehealth and telecare (as utilised in to estimate the size for the telecare market in Figure 6), shows that there was a small drop in revenue for these organisations in 2009 but has subsequently recovered.

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[20] GVA can be defined as: Operating Profit + Employee Costs + Depreciation – Amortisation: BIS RDA evaluation: Practical Guidance on Implementing the Impact
Evaluation Framework (2009)
[21] Office for National Statistics: http://www.ons.gov.uk/ons/rel/abs/annual-business-survey/2010-revised-results/abs-2010r---revised-results-statistical-bulletin--june-2012-.html

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Figure 8 Turnover (millions) of four major telecare providers from 2008-2011

Where turnover has been captured for 2008 through to 2011 for organisations engaged in independent living (n=87), the trend has been plotted in Figure 9 (regardless of the proportion pertaining to independent living and regardless of whether all of their business is based within the UK). A similar trend is also observed here, namely a small reduction in revenue in 2009 followed by recovery. In both cases (Figure 8 and Figure 9) the sample comprises large organisations which are likely to be financially stable which may contribute to the observed trend.

Figure 9 Turnover (millions) for 87 organisations where data was available for 2008-2011.
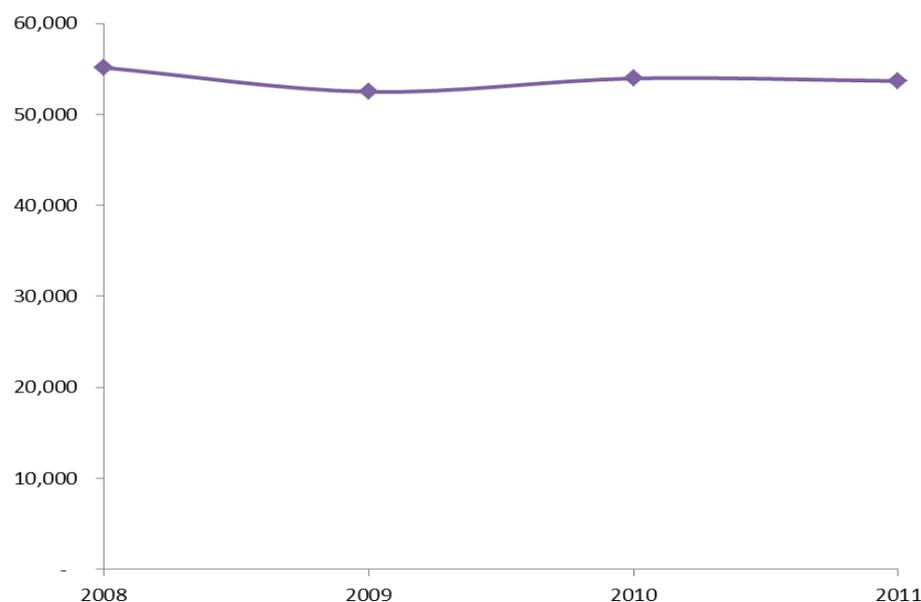
Of those organisations identified at the baseline, there were 22 public sector organisations and 20 third sector organisations. Of the 20 third sector organisations identified, turnover was captured for 9 covering the period from 2008 through to 2009, the trend for which is

shown in Figure 10 (regardless of proportion devoted to independent living). As shown below, these organisations also appear to have maintained a relatively stable level of turnover since 2008. Considering those that reported the proportion pertaining to independent living (n=6), turnover equates to £41m in 2011. Data for these 6 organisations have not currently been grossed up in the absence of data on the scale of the remaining 14 organisations.

Figure 10 Trend in turnover by third sector organisations (n=9).
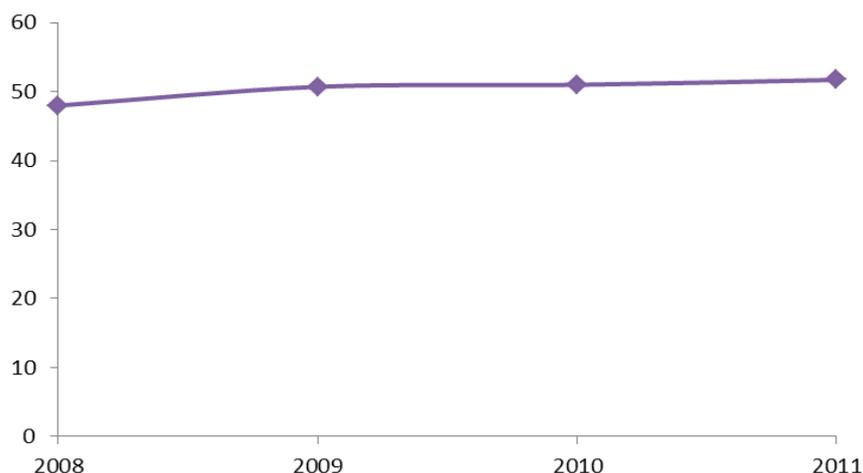
Despite prior removal from the database of NHS and local authority contacts, there were some organisations which, once contacted, reported an NHS or local authority link. These organisations comprise the majority of public sector organisations (n=15) identified. Financial details were therefore not often captured. However, excluding these organisations identifies 3 where turnover and proportion pertaining to independent living was reported in 2011, totalling £28m. Data for these 3 organisations have not currently been grossed up in the absence of data on the scale of the remaining 4 organisations.

6.1.2 Operational information and R&D spend

Operational information and R&D spend was only available for those organisations which were interviewed at the baseline stage (n=96). Most organisations were unaware of whether patents had been previously submitted, in total 18 patents were reported by 7 organisations between the years 2008-2012, the majority of which (16/18) were anticipated applications for 2012 or later. Given that they were mostly planned applications respondents preferred to keep the details surrounding these patents confidential.

Respondents were often unsure of historical and current R&D spend within their organisations. This data is something which will need to be supplemented at later stages of the evaluation, as discussed in Section 6.2.2. A summary of data provided is shown below.

Figure 11 R&D spend reported by organisations able to provide data

Year	Average R&D spend on independent living	Sample size on which average is based
2008	£12,500	2
2009	£25,000	2
2010	£83,333	3
2011	£ 515,400	5
2012	£ 138,000	4

6.2 Improving the baseline estimate

6.2.1 Representation of the sector

To ensure that we have represented all companies within the UK independent living sector, it is important to ensure that those identified in existing studies and databases have been captured. In particular cross-referencing and including any missing organisations from the following two sources would improve our estimate:

- **Stage 1 unsuccessful applicants for dallas funding**. This pool includes 465 organisations, however the database supplied to Databuild only included the 105 organisations which progressed to stage 2.
- **Organisations referred to in the Assisted Living UK Capabilities and Opportunities Report 2012**[22] (discussed further in Section 6.3 below) referenced earlier in this report. This includes work carried out by Medilink which identified organisations selling telehealth, telecare and environmental control solutions by UK region.

To achieve this, the Technology Strategy Board is currently exploring whether the list of stage 1 unsuccessful dallas applicants and the database of organisations identified by Medilink can be shared with Databuild. If this is possible, we can review these databases at the interim stage of the evaluation. This will allow us to identify any missing organisations, carry out additional Companies' House report searches and ensure that we are tracking all organisations involved within the sector.

Additionally, the organisations included within the current baseline population provide a broad spectrum of systems, services and products. As identified by a member of the Technology Strategy Board, capturing the economic baseline would benefit from a precise definition of the sector. Databuild would therefore like to work with the Technology Strategy Board in refining the definition as the project progresses and ensuring that all organisations included are relevant to the sector upon which dallas may impact.

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[22] Technology Strategy Board and Knowledge Transfer Network; Assisted Living UK Capabilities and Opportunities Report 2012: http://www.healthktn.org/capabilitymap/download.html

6.2.2 Data capture

It is essential that the economic data for those organisations participating in dallas is particularly robust, as these organisations are likely to see the greatest impact from activity. Although participation in interviews by dallas community members was good; few were able to give numerical data over the telephone. Of the 18 interviewed; 4 gave full figures, 4 gave partial figures and remaining respondents agreed to give further figures by email but have yet to provide this information.

This was discussed with members of the community at the leads meeting held on the 23rd January 2013. To obtain the required data, economic metrics should be included within the monitoring and evaluation process conducted by each community. Each lead has agreed to hold a discussion with Databuild on their individual requirements and the metrics which ultimately need to be included in their monitoring and evaluation process.

Community leads also raised the point that all organisations involved were already submitting some financial data to the Technology Strategy Board and whether it would be possible to have an arrangement whereby they could agree to have these forms shared with Databuild.

Additionally, where organisations were identified as being involved in independent living but were not part of the interview sample (i.e. they were not part of an ALIP project or dallas), Databuild could explore with TSB whether they can be interviewed at the interim stage to fill data gaps. This will also be important in providing a comparison group of organisations which have not directly participated in dallas or ALIP, and to track any changes in their activity over the period of the dallas programme.

Data relating to research and development activity proved particularly difficult to capture with organisations interviewed. To improve baseline data, we propose to captured additional indicators of R&D spend at the interim stage. For example, we may have more success capturing:
- Number of staff employed in R&D
- Number of new products launched
- Whether organisations have secured any grants or tax credits for R&D
- Whether organisations have worked with universities.

Going forward, another important facet of economic impact is likely to be the number of individuals able to return to work with the support provided by independent living systems, services and products. This will include both those benefiting from the technology and those who care for individuals that could benefit. Databuild are working with University of Glasgow to develop a means to capture this type of data through the evaluation of benefits to the individual.[23]

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[23] A report produced by Tunstall and Carers UK which interviewed over 4,000 carers indicates that one in eight carers believed telecare/telehealth had helped them stay in work or return to work alongside caring: http://www.carersuk.org/media/k2/attachments/Carers_and_telecare_Sept2012.pdf

6.2.3 Identifying existing sources of information

At the recent Economic and Business Models workshop attended by Databuild on the 12th December 2012, we were made aware of an existing study which explored patents submitted within the independent living sector. Databuild would like to access this research and use it to inform/add to the findings from our baseline interviews. Given that this project concentrated specifically on patent information it is likely to provide a more comprehensive review of all potential sources of information where this information can be found. If this information cannot be shared directly we would like to explore whether the methodology can be shared with Databuild to ensure our processes are aligned.

6.2.4 Exploring statutory service procurement spend

Qualitative research conducted has indicated that there are very few organisations currently selling to the open retail market. Tracking budgets spent on independent living by the statutory service over the previous 5 years may also therefore provide valuable information to inform and contextualise the economic evaluation. As indicated in Section 7, representatives interviewed from the statutory services were often willing to share budget information with us. We therefore propose to devote resources at the interim stage to additional desk research or interviews to identify whether this information can be incorporated into the baseline.

7   Public sector consumers

A total of six qualitative interviews were held with individuals from public sector bodies; four with individuals from NHS organisations, one with a housing association and one with a local authority. Each had varying degrees of involvement in the independent living sector and awareness of the Technology Strategy Board; ranging from being directly involved in dallas to knowing very little about the Technology Strategy Board itself.

7.1 Engagement in independent living

All six respondents had similar views on how they would define independent living. Most saw it as enabling or empowering an individual to manage their own lifestyles as much as possible. As observed for those within industry and commerce there was still a focus by those not involved in dallas on those with health conditions.

> *"So independent living is about giving people with disabilities the ability to manage themselves."*
>
> *"To me it means a person in their usual home environment being able to manage their own lifestyle with minimal support."*
>
> *"Independent living can mean a number of things, but we look at any service or products that support an individual's ability to live either on their own or with the maximum appropriate independence."*

The majority of respondents cited the reasons for getting involved in the independent living technology sector as a necessary step that the public sector needs to take to alleviate strain on resources or as a natural progression of their existing principals.

> *"We need to engage with technology and change the way we deliver services to allow people to live longer on their own, because if we don't, the NHS will break."*
>
> *"As the organisation has developed it has extended its range of services beyond purpose built accommodation to include services to support people to stay at home and also the telecare service sector. It was a natural progression in keeping with the original intention of the organisation."*
>
> *"We started 13 years ago with a vision of rather than people always accessing services and becoming dependent on them; we would have a principal objective around giving people information and advice in order for them to make their own choices. About three years ago we started looking at how we can do that with people who have chronic illnesses; we saw it as a natural extension of our core principals."*

The kinds of independent living products, services or technologies that are being purchased by public sector organisations varies from organisation to organisation depending on what they considered to be a product that enabled independent living. Some purchased more technologically advanced assistive devices but others included low-tech solutions such as walking aids and specialist mattresses as part of the remit.

> *"Various different types of wheelchairs, aids for people in the home – pressure relieving mattress of a specialist nature, walking aids products for bathrooms."*
>
> *"We have been buying things like property exit sensors, care assistance, smoke alarms and fall alarms."*

Interestingly, there appears to be some regional differences when it comes to the suppliers the public sector use to procure independent living products and technologies. On the one hand, Scottish organisations prefer to avoid the big technology companies who dominate the market if possible, because they do not wish to use the companies that they believe

stifle innovation. Respondents based in Northern Ireland and Liverpool used a single supplier for the majority of their procurement, which was often Tunstall. These respondents believed that using the larger suppliers provided benefits such as economies of scale and ensured interoperability of products purchased.

In some cases, the public sector is starting to recognise the need to procure equipment from different suppliers, rather than a single supplier as different individuals have different needs and requirements.

> *"We first started procuring telehealth/telecare technologies in 2008. Back then we were buying one kind of unit from a single provider with a single platform. More recently; in the last 18 months we have recognised that one size doesn't necessarily fit all. We have moved to a software based solution supported by an agnostic platform...for example we would procure a hub and that hub would allow us to attach a number of very different peripherals (blood pressure monitors, call alarms etc) from different suppliers."*

7.2 Expenditure on independent living

All respondents, bar one, were comfortable discussing the expenditure relating to independent living and most were able to give fairly accurate indications of what their budgets were. This ranged from around £40,000 a year for smaller organisations with responsibility for their own region, up to £7-8,000,000 for much larger national organisations. Funding generally comes from core NHS funding, mainstream council funding and commissioner funding.

> *"I would expect our expenditure on telehealth alone to be in the region of £800,000."*
>
> *"We are talking about £1,000,000 a year."*
>
> *"In terms of contract values it is currently in the region of £7-8,000,000."*
>
> *"Thinking about purely telecare we spend about £200,000 a year on new equipment and a further £220,000 on the monitoring services/installation costs etc."*

As discussed in Section 6.4.4, exploring procurement budgets within these organisations could be a way of improving the baseline estimate at the interim stage and also tracking change brought about though dallas activity.

7.3 Plans for future procurement

Due to the current period of transformation in the NHS, there is a high degree of uncertainty surrounding the procurement of independent living technologies. In some cases budgets for independent living have yet to have been decided as overall budgets are not confirmed. Generally the view is that expenditure will stay consistent or increase over the coming years; one respondent stating that their intention is to diversify and offer a wider range of services through working with the dallas programme. Another issue for national organisations is that, at the moment, assisted living programmes are localised and it is unclear at this time how a national scheme would work.

> *"I would like to be able to diversify, and the way we will be able to achieve that is by merging locally through the dallas partnerships. That will allow us to increase the amount of stand alone assistive technology that we can offer."*
>
> *"At the moment I can't give an idea of what the projected budget is yet because the council hasn't set its budget yet. However I have been reassured that there is sufficient funding for this area."*
>
> *"Expenditure will roughly stay at about £1,000,000 a year as we expect a reduction in the price of the technologies as they become more popular."*
>
> *"The future is a real challenge for us because we are very much a national organisation. An awful lot of assisted living programmes are very much local. It is difficult to see where a nationally delivered service might fit in. At the moment we are reviewing our options and we are going to have to make a strategic decision on our role within assisted living."*

7.4 Barriers to procuring independent living technologies

7.4.1 Barriers to the public sector investing in independent living technologies

Interestingly, respondents had quite a range of views on what the issues were for the public sector when it comes to investing in these technologies. There didn't appear to be one major barrier that was universal across the board. However, some respondents mentioned similar obstacles to those mentioned in the private sector. For example, one respondent said that what was missing was a clear evidence base supporting the different products that were available at the moment and being able to compare competing products. Similarly, another respondent thought there was no clear vision on where things should be going in the sector.

> *"If you are looking to argue anything for investing in prevention and assistive technologies, you've got to have an extremely clear evidence base...and unfortunately the savings to health and the actual evidence base for social care is quite limited."*
>
> *"At the moment there is a lack of clear vision and associated plans on where commissioning groups are going. There is no real clarity and nobody is clear what they want to do and there is so many other things on the priority list and I am not sure where assisted living really sits on that."*

Another obstacle identified by respondents was the fact that the NHS is in such a period of change and restructuring that getting involved in the procurement of new technologies is just not something that is desirable to be doing in a time of such uncertainty and transformation. This coupled with a lack of money available due to reductions in funding means that the NHS is not in a good position to embark on new procurement plans.

> *"I think, as with many things, it is increase in pressures in budgets at a time of decreased funding. The demand rises but the amount of revenue coming in to fund that demand is continually being reduced. It is a case of doing more with less."*
> *"At this particular time you have got PCTs closing down and CCGs opening up; a whole new structure is coming in. Trying to run nine month procurement during this time is nightmare territory. Things will settle down, but at this particular point there is a whole system change involving transfer of contracts, of liabilities and people just don't want to go through that kind of procurement at this time."*
>
> *"There is not an awful lot of money around and it is difficult to see where any large sums of money will come from to fund a big scalable project."*

7.4.2 Barriers to individuals buying independent living technologies directly

On the whole, respondents felt that it would be very difficult for individuals to buy independent living technology directly. Firstly, respondents echoed many of the social barriers cited by industry and commerce representatives. Lack of awareness of products, systems and services available was described as a key barrier along with the difficulty individual's face in accessing the technology.

> *"The main barriers are the lack of knowledge of that technology, stigma surrounding that technology and people's ability to access that technology."*
>
> *"Basically the public demand for these services isn't there at scale because of lack of awareness."*
>
> *"I think the barriers for individuals are knowing that it exists, knowing that it will do what it says on the tin, having a way to access help if it goes wrong, cost of equipment and the ongoing cost of maintenance."*

Secondly, respondents believed that there needs to be a support package behind products and systems purchased in order to carry out monitoring; it is not as simple as buying a device and attaching it to a mobile phone or set top box. This is particularly relevant for products in the telecare remit.

> *"The more advanced stuff where there is a support package that sits behind the technology. You can't just buy the piece of equipment because you need the support behind it to do the monitoring. At the moment, traditional telecare would be paid for by the local authority."*
>
> *"If a commissioner buys some technology the governance process makes sure data exchange is secure, the readings are collaborative etc. However, if I was to buy something from Boots, I've got to link it up to something. If I ask a provider to link my device up there is a whole load of questions and governance issues."*

Another issue identified by respondents is that the major players in the market are not viewing the public as a customer. They see the local authorities and the NHS are their only customers and this therefore results in a lack of information and an absence of a practical way of accessing the products and technologies.

7.4.3 Barriers to the development of new innovative technologies

All respondents had the same or similar view that the barrier preventing the development of new innovations is that it is the small, start-up companies that are innovative and not

the larger organisations. The problem seems to be that while innovation is coming from the small firms in the market, they have no way of competing with the major players. Procurement for these small companies is a real issue because the NHS procurement framework locks them out. This opinion was echoed by many of the industry and commerce representatives interviewed; where the procurement process for the statutory service was cited as main barrier to sector growth.

> *"Innovation in technology comes from the small firms and not the major players in the market. However procurement for these small firms is a killer. They can't sell to the NHS because of the procurement mechanism not allowing that."*

Attached to this is the issue of interoperability and interconnectivity. A new innovative design is unlikely to work with a unit produced by one of the big players and therefore the NHS is unlikely to buy them because they won't work with the equipment they already have.

> *"Interoperability. A small firm's equipment won't work with a Tunstall unit or a Phillips unit or a Docobo unit, so the NHS won't buy them."*
>
> *"...yes, it is a lack of truly open standards, interoperability and interconnectivity."*

7.4.4 Are there any independent living technology needs that are currently unmet?

Half of the respondents felt that there were not any unmet needs in the independent living technology space at the moment and the remaining half all had different opinions of where the focus needs to be. One respondent believed there is too much focus on technologies that keep people safe in the home, but actually we want to be keeping people mobile and maintaining their lifestyle. Therefore, there needs to be more attention given to products that will work outside of the home as well. Another respondent was of the opinion that too much attention was put on the transfer of data between patient and clinician and not enough was spent on transforming that data into information that is beneficial for the patient.

> *"I think we focus we focus far too much on the transfer (particularly in telehealth) of data from patients to clinicians and we don't focus on the collection of data from the patient, turning that data into information and advice the patient can understand and then can give it them back."*

Furthermore, a couple of respondents felt that there needed to be a simplification of existing technologies so that they were more attractive and more useful to the public sector. Interestingly, this fits in the with the view of industry and commerce representative and sector experts who felt the public sector did not know how to use the

technologies available and required training, however from a public perspective it is the technologies that need to be less complex.

> *"I think there needs to be a 'dumbing down' of technology so that telehealth can be much simpler and much more accessible."*
>
> *"I think we need some simpler options. The problem for me is that I know I can go into B&Q and buy a controller for under a £100 but if I buy one that is a medical device then I have to pay £1000 even though they both do the same thing; there is a huge extra cost for medical devices."*

8 Conclusions

The market failures identified by the communities underpinning the dallas programme logic (such as lack of awareness and trust in products, systems, services available and interoperability) are significant barriers to the growth of the independent living sector and have been reiterated by interview respondents. However, in addition to the market failures identified explicitly by the communities, interview responses suggest the following themes are also important:

- A barrier to market entry for SMEs, who struggle to secure statutory provision contracts; this is also thought to stifle innovation which is thought by industry and the statutory service to occur mainly within these smaller organisations;
- A lack of finance available for technology producers to invest money in developing and marketing products for the retail market;
- Financial barriers to the consumers whereby the cost of technologies currently available to them is prohibitive.

If these barriers can be overcome, either through the actions taken by dallas communities or otherwise, sector experts and industry representatives believe that the sector will grow. The activities proposed and being taken forward by the communities will enable consideration to be given to the extent to which the market failures can be overcome (insofar as they are specifically designed to address the significant barriers to market growth evidenced in the baseline):

- Lack of awareness (information failure) is being targeted through marketing campaigns and engagement which targets individuals and their needs directly. Platforms are also being designed through which products, systems and services can be purchased and subjected to review.
- Interoperability, is being considered across all community activity encompassing products, services and information flow. Where this is successful it will address current coordination failures preventing market growth
- dallas communities also involve NHS partners. Statutory procurement representatives interviewed in this study anticipate that this will help to demonstrate how some of the statutory and regulatory barriers reported by industry and commerce representatives may be overcome (e.g. barriers to entry). However, whether this will be sufficient to invoke a culture change across procurement in the wider population, opening the door to smaller organisations not directly involved within dallas, is unclear at this stage.

- Similarly, the financial investment made through dallas benefits the consortium of organisations directly involved. However, whether this will encourage wider investment by UK companies is currently unclear, and will need to be monitored.
- The baseline evaluation has confirmed that there are a number of initiatives and policies other than the dallas programme that may impact on the market for independent living products, systems and services (e.g. ALIP projects, 3millionlives and Personal Budgets), and has highlighted the need for the interim and final evaluations to keep this in mind in developing a suitable approach for considering what would have happened in the absence of dallas.

The work carried out at this baseline stage has enabled an early estimate of the sector for private sector organisations with turnover within the region of £650m for 274 organisations, and GVA totalling 49% of this figure.

Considering the third sector and public sector organisations for which turnover and proportion of activity involving independent living was reported (n=9), these contribute £70m in revenue. There are, however, a further 18 third sector and public sector organisations for which data unavailable. The contribution of third sector and public sector organisations is therefore likely to be larger.

9 Implications for the evaluation

Organisations currently involved in the independent living sector view the target market for products, systems and services as the 'younger older population' (60-75 years of age), and those with long term conditions. The focus of dallas activity is the entire population and will aim to encourage individuals of all ages to take responsibility for their own health and wellbeing. A shift in the definition of the sector and the types of products, systems and services available at the interim and final stage of evaluation may therefore indicate the impact of dallas activity.

There are still a number of data gaps concerning economic metrics at the baseline, and extrapolation methods have been applied where possible to derive overall estimates. The baseline would therefore benefit from revision as further evidence becomes available. As outlined in Section 6.2 of this report; there are a number of additional sources of information and methodologies which would enable this improvement. We recommend that these are explored further prior to the interim evaluation with the Technology Strategy Board.

In addition to these methodology improvements, the baseline stage has shown that organisations are more willing to provide information when they have received confirmation of the involvement of the Technology Strategy Board within the research. Therefore any new organisations identified as contacts for latter stages of the evaluations should ideally be pre-notified. We recommend that a letter from the Technology Strategy Board is prepared for Databuild which can be sent out upon request to maximise the response rate.

10 Next steps

Databuild will schedule discussions with community leads to ensure that valuable economic metrics are captured during monitoring and evaluations carried out by communities.

Databuild will ensure recommendations for improving the baseline evaluation going forward are included within the interim methodology report and discussed with the Technology Strategy Board.

11 Appendix 1 – community programme logics and assumptions

11.1 Year Zero – programme logic and assumptions		
Programme Logic	**Description**	**Assumption**
Activity *Producer activity*	YZ will establish a community of individuals linked though products and services aimed at supporting/enabling them to manage their own health. Products and services will be developed with other businesses within the consortium through a 'joint exploitation vehicle' which will be launched through the community. The joint exploitation vehicle framework ensures that YZ will continue to have the rights to distribute products and services developed.	The funding raised by Year Zero will enable products and services to be developed that would not otherwise have been developed. Year Zero will enable products and services to be developed more quickly and at greater scale than they would otherwise have been developed.
Market activity	Products/services produced will be linked with one another (ERedbook, Health Family Tree and Good neighbours) allowing cross-promotion of products produced. External organisations will have an opportunity to reach target market through the community. The organisations may include those selling products and services but also those wishing to distribute public health messages and other important information.	• Individuals from the target audience will join the community. • Cross-promotion will lead to individuals using more than one products/service.
Output	Products developed and trialled through community engagement (e.g. Redbook and Rallyround). Products will be linked to the statutory service.	Products and services produced will be linked to the statutory services or product can be successful without the statutory link
Outcome	Roll-out of YZ products and services to UK retail market and internationally. (products and services will be sold primarily to service providers not directly to the individual)	• There is a UK retail market for products and services developed • YZ are able to exploit the UK retail market • There is an international retail market for products and services • YZ are able to exploit the international market
Impact	• Sales from products and services (UK and internationally) • Substitution of products/services produced internationally for those produced by YZ • Increased and safe-guarded employment e.g. technology producers/service providers • Cost benefit of reduced interaction with GP/hospital (for products linked to statutory service) • Individuals returning to work e.g. those directly purchasing technology • Individuals taking less time off work due to hospital/GP visits • Increased capacity of paid health and care practitioners as a result of technology • Sales from statutory service procurement • Revenue from analytics and communication	

11.2 Living it Up – programme logic and assumptions

Programme Logic	Description	Assumption
Activity *Producer driven activity*	LiU will develop a community (initially aimed at individuals over the age of 50). Using the community as a platform LiU will establish a trusted marketplace for independent living products. Community consortium involves 12 industry partners. SMEs in Scotland approached to encourage listing of services and products.	• Individuals will join the community (i.e. become a member) • SMEs will join the LiU community. SME members will make active use of the platform by listing products and services on the market place.
Market driven activity	Community match individuals with products and services which may benefit them. Products and services offered will be an open marketplace but underpinned by peer review. In addition to peer review there will be an 'innovation zone' where users can comment on what they need providing a direct feedback loop to product, system and service producers.	• LiU users will make purchases as a result of joining the community that they would not otherwise have made • Customers will use the peer review feature and review products and services they have purchased • Peer review will result in the purchase of the best products/services • Customers will use the innovation zone to outline their needs • Industry will use the innovation zone to inform product, systems and service development
Output	Industry partners and SMEs list services and products on the LiU marketplace. Services and products are purchased by community members	
Outcome	Identification of successful products/services. Producers/service providers begin to sell the products and services shown to be successful in the LiU marketplace to individuals through other platforms (i.e. other technology sale points, online retail sites etc.)	• There is a retail market outside the LiU user market for products and services • Industry partners and SME's will roll products and services out to other sales platforms
Impact	• Sales of products and services (UK and internationally) • Substitution of products/services produced internationally for products/services produced by LiU consortium and SME's involved with community • Increased and safe-guarded employment e.g. technology producers/service providers • Unpaid/informal carers return to work – i.e. become more economically active • Individuals returning to work e.g. those directly purchasing technology • Increased capacity of paid health and care practitioners as a result of technology	

11.3 Mi Liverpool – programme logic and assumptions

Programme Logic	Description	Assumption

Activity
Producer driven activity
	Mi Liverpool may provide funding for development of products & services (TBC). Pump priming of product development by the Mi Liverpool will be limited as it is believed that products, services and systems to support independent living already exist. Though there may be a requirement for innovation to enhance existing provision, the key issue is that existing products/services/systems are not being deployed effectively, creatively and at scale by practitioners. Furthermore:
	
	    o Community awareness of existing products/services/systems is limited
	    o A relationship between end users and product developers isn't in place (as we are in primarily a wholesale situation)
		• Funding is provided for the development of products that would not have been developed otherwise.
		• Development is successful and products and services fit to be trialled are produced.

Market driven activity	Aim to increase levels of independence and self-care in Liverpool supported by increased access to independent living technology on the open retail market (e.g. on amazon, high street and other sites). Community activists will assess potential needs of the individual, discuss with family, friends and neighbours to improve awareness of technologies available. Provision of advice through centres, net TV, telephone line and also installation support. - through the things that people like and need to do inc. sports, shopping, arts/culture, travel etc. Additionally, Mi Liverpool will aim to enable the public and third sector to make informed procurement decisions (sensitive to people's needs and demands) that can stimulate implementation at scale and embed key technologies (and services) within health and social care service provision.	• Customers require support in identifying independent living products/services that will make a difference to their lives • Those receiving advice from Mi Liverpool community activists, advice line or support centres will make purchases that they would not otherwise have made

Output	Increased awareness of independent living technology products and services available.
	
	That challenge traditional and deeply held views (of consumers, health and social care professionals, commissioners and procurement professionals) of what happens when a person becomes ill (doctor/nurse/hospital) or vulnerable (home carer/ care home)
		• There is a UK retail market for independent living products and services
		• There is an international retail market for independent living products and services.
		• There is scope to grow the retail market for independent living products and services
		• Mi Liverpool marketing will increase awareness of products and services available and increase awareness of the impact they can have on an individual resulting in:
		  o Greater number of independent living technology services and products
		  o Increased demand/purchases will increase supply of services and products on retail market

Outcome	Demand for independence and control, supported by technology. Greater Awareness of how technology can support independence and confidence in technology will result in greater demand of products and services and thus a) greater supply on retail market b) increased requests for technology from practitioners as part of care and health packaging/bundling	
Impact	• Increase in sales products and services (UK and internationally) • Increased and safe-guarded employment e.g. technology producers/service providers • R&D spend on products funded by Mi Liverpool • Reduction in housing tenancy turnover as a result of retained independence • Unpaid/informal carers return to work – i.e. become more economically active • Individuals returning to work e.g. those directly purchasing technology • Increased capacity of paid health and care practitioners as a result of technology.	

11.4 iFocus – programme logic and assumptions[24]

Programme Logic	Description	Assumption
Activity	Interoperability seen as major barrier to ensuring independent living technology become mainstream/available on the retail market. I-f will enable interoperability between communities in terms of service, core systems, products, data flows. Three layers to i-f activity: 1. Identify dallas specific interoperability needs 2. Process for interoperability standards generalised to UK market through stakeholder collaboration and development of an independent living kite-mark 3. Develop and launch products and services for individuals e.g. WarmNeighbourhoods	• Interoperability is the barrier to independent living technology availability on the retail market • Customers will sign up to WarmNeighbourhoods
Output	Interoperability standards achieved within dallas and defined for sector. Products and services aimed at the individual (e.g. WarmNeighbourhoods) trialled.	• The independent living technology market accepts i-Focus standards as the solution to the 'interoperability' blockage

Outcome	Products and services coordinated across all four communities. UK standards introduced for independent living technologies. WarmNeighbourhoods and other individual focused products and services rolled out to UK market	• Products and services developed by communities produced:
		   o At lower cost
		   o Faster
		   o At greater scale
		• There is a UK market for WarmNeighbourhoods and other products and services developed for the retail market

Impact	• Reduced development costs across dallas communities (both time and £) • Sales of WarmNeighbourhoods (and other retail focused services and products developed) • Increased R&D spend on development of products and services for retail market • Increased sales for technology providers (both as a result of interoperability and through access to wider markets e.g. energy) • Increased and safe-guarded employment e.g. technology producers/service providers	

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[24] In developing the programme logic for i-Focus, we have concentrated on the aspects of their work streams which are likely to result in direct economic benefits. We have received comments from i-focus suggesting additional indicators that we may wish to consider including in the study. We will be organising a conference call with i-Focus to discuss their comments prior to finalising the methodology.

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