MAPPING NORTHERN IRELAND'S HOUSING MARKET AREAS

Report for the Northern Ireland Housing Executive

Final Report 3 August 2018

Contents

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Data sources

Census special flows tables have been sourced from Office for National Statistics (ONS) licensed under the Open Government Licence, including:

- ONS 2011 Census: Special Migration Statistics (United Kingdom) - UK Data Service Census Support. Downloaded in May 2018 from: https://wicid.ukdataservice.ac.uk
- ONS 2011 Census: Special Workplace Statistics (United Kingdom) - UK Data Service Census Support. Downloaded in May 2018 from: https://wicid.ukdataservice.ac.uk

- NOMIS tables: supplementary Census and labour market data from the National On-Line Manpower Information Service: https://www.nomisweb.co.uk
- Maps: the underlying map base used in this report and in the workshop presentations come from three sources: CARTO, OpenStreetMap and HERE Technologies.

Executive summary

The Northern Ireland Housing Executive (NIHE) commissioned this study to enhance understanding of the concept of functional housing market areas and to update the suite of 11 broad housing market areas (HMAs) that were originally defined in 2009.

The updated HMAs set out in this report are primarily intended to provide NIHE with a spatial framework to support their analysis of local housing systems and their internal strategy development processes. However, the HMAs should also assist local authorities to more clearly understand the broad HMA of which their local area is part. This in turn should help to clarify which local authorities should look to collaborate in planning for housing development across the broad HMA.

Functional economic geographies relate to the spatial area over which markets operate and are not necessarily aligned to, or constrained by, local authority boundaries. The geography of functional HMAs are shaped by where people live and work and the spatial area over which people search for and choose a new home without changing their place of work. As a result, broad HMAs, which are also referred to in the research literature as sub-regional or strategic HMAs, represent the spatial area where the vast majority of people of working age both live and work and where those moving house without changing employment choose to stay.

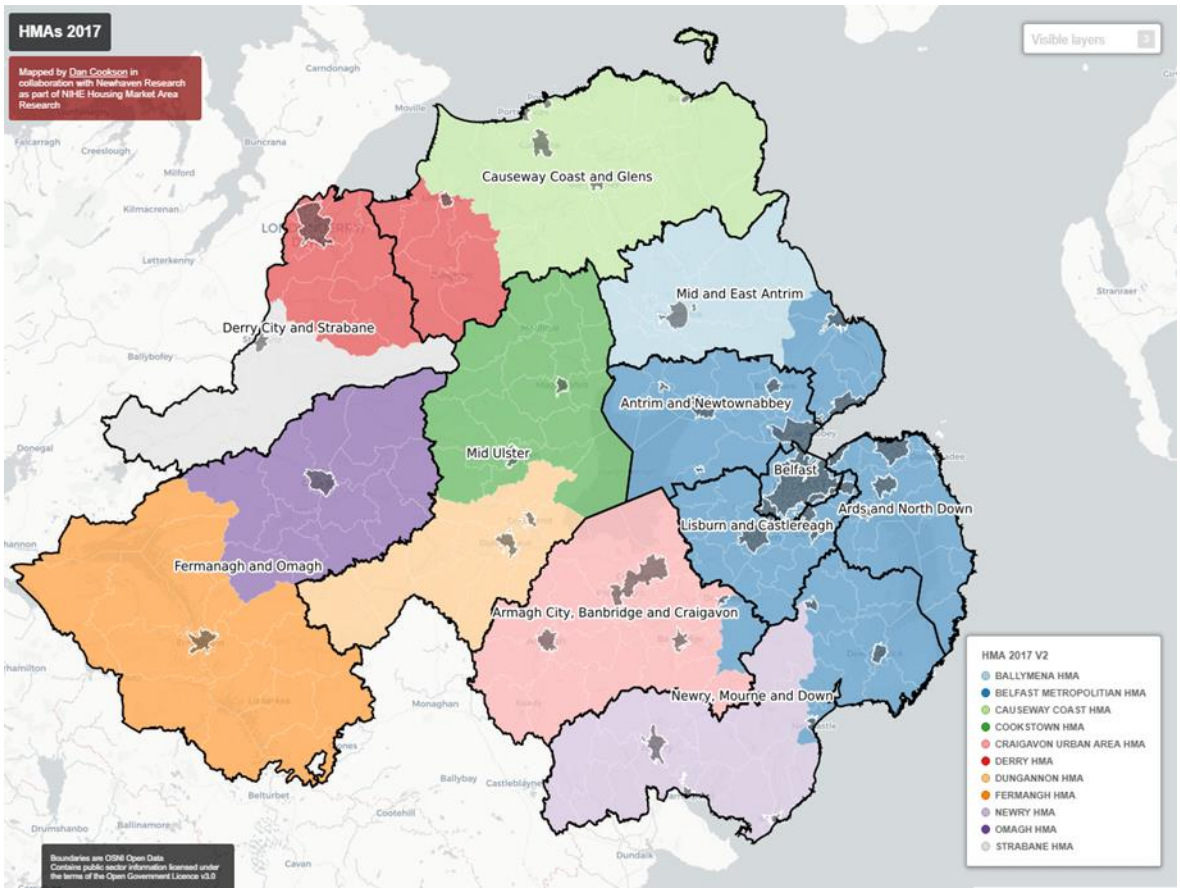
In the last 20 years, the need to understand housing markets and the spatial area over which they operate has become widely accepted as an important part of the housing planning and policymaking process across the UK. Today, the use of broad HMAs as the starting point for analysing housing systems is seen as a prerequisite for ensuring local planning and policy decisions are more responsive and sensitive to changing housing market conditions.

There is no single or widely accepted method for defining and mapping the spatial extent of broad HMAs but there is broad agreement that the delineation of the 'outer shell' of an HMA should draw on evidence of internal migration and commuting flows. This study, which was carried out between February and June 2018, involved a review of relevant documentation plus:

- An analysis of Census 2011 data and an anonymised sample of over a million records from the Medical Cards Registration (MCR) system. The MCR data was used to explore patterns of residential mobility between 2011 and 2017, to explore the linkages between different urban and rural areas and the influence of employment centres in terms of residential flows. The findings from the MCR analysis were then compared with Travel to Work Areas (TTWAs) as well as evidence from the 2011 Census in regard to commuting and migration flows.
- The overall validity and integrity of the 11 prototype HMAs derived from the data analysis were explored through dialogue with NIHE staff and external stakeholders, including local authority spatial planners, academics and representatives from housing and planning bodies in Northern Ireland. This involved a mix of telephone interviews and five workshops. A small qualitative telephone survey with 11 estate agents was also carried out.

The final recommended boundaries for the 11 functional HMAs that operate across Northern Ireland are shown in the map below (see figure ES1). There have been some relatively modest adjustments to the spatial extent of some broad HMAs, most noticeably the Belfast Metropolitan HMA and those housing market areas that adjoin it. However, there has been no change in the numbers of broad HMAs that operate in Northern Ireland in the last decade in spite of the housing market downturn.

Figure ES1: Finalised Housing Market Areas (HMAs) for Northern Ireland, 2017 based



Looking across Northern Ireland:

- The Belfast Metropolitan HMA remains the largest and most populous housing market, although its northern boundary no longer extends north of Larne town or to the rural wards at the southern east edge of Mid and East Antrim Local Authority (LA) such as Kells. Likewise, its southern boundaries no longer extend as deeply into two local authority areas: namely the Armagh City, Banbridge and Craigavon LA and the Newry, Mourne and Down LA.
- The Craigavon HMA and Newry HMA, which lie to the south of the Belfast Metropolitan HMA, have somewhat expanded in spatial terms. In the case of the Craigavon HMA, this is largely due to a decline in the share of people relocating to the area in and around Banbridge town from the Greater Belfast area. In the case of the Newry HMA, it reflects a decline in people moving to the area to settlements and rural areas that do not lie in very close proximity to the A2 road south of Ballynahinch. These changes are most likely a reflection of the extended housing market downturn that has existed for the last 10 years. However, it is not possible to ascertain if these changes are likely to be anything other than cyclical.
- The Ballymena HMA remains more tightly drawn than the corresponding TTWA. This is mainly due to the low level of residential flows to (and from) settlements and coastal wards to the north east of the town that fall within the Causeway Coast TTWA as opposed to any substantial changes in the residential movement patterns of households relocating from Greater Belfast or elsewhere in the Belfast Metropolitan HMA.

- The Derry HMA has been subject to only minor adjustments, which have mainly resulted from adjustments to the methods used in this study relative to those used in 2009.
- The Causeway Coast HMA has somewhat expanded, mainly due to the re-assignment of some rural wards, such as those in the Antrim Glens area, from the Ballymena HMA. There wards were previously assigned according to their TTWA status due to the absence of robust small area data to explore patterns of residential mobility.
- There has been little change in terms of the spatial extent of the predominately rural housing markets known as the Strabane HMA, the Omagh HMA, the Cookstown HMA, the Dungannon HMA or the Fermanagh HMA. Outside of long distance residential movements, mainly to (and from) the Belfast Metropolitan HMA, these predominately rural housing markets have few, if any, significant links with any other housing market.

Consistent with both the study remit and with common practice, we have assigned each ward to one HMA only. However, some rural communities display scant connection to any nearby local employment centre and any future analysis and policy should be mindful of the unaligned character of these rural communities and localities. These largely 'unbounded' rural areas are most commonly found in the five predominately rural HMAs noted above.

The literature suggests that HMA boundaries are fuzzy and can overlap. However, outside of the Belfast Metropolitan HMA and the two HMAs that adjoin it, the spatial extent of housing markets in the rest of Northern Ireland appear to be deeply entrenched. This may help to explain why the Banbridge area was the only major area of overlap we could identify. This area is located within the Craigavon HMA but is subject to influence from the Belfast Metropolitan HMA and, to a lesser extent, from the Newry HMA. Whatever pragmatic decisions the NIHE make in terms of the potential alignment of the broad HMA boundaries to the administrative boundaries of the 11 local authorities, it is vital that that the distinctive nature of the Banbridge area is taken fully into account.

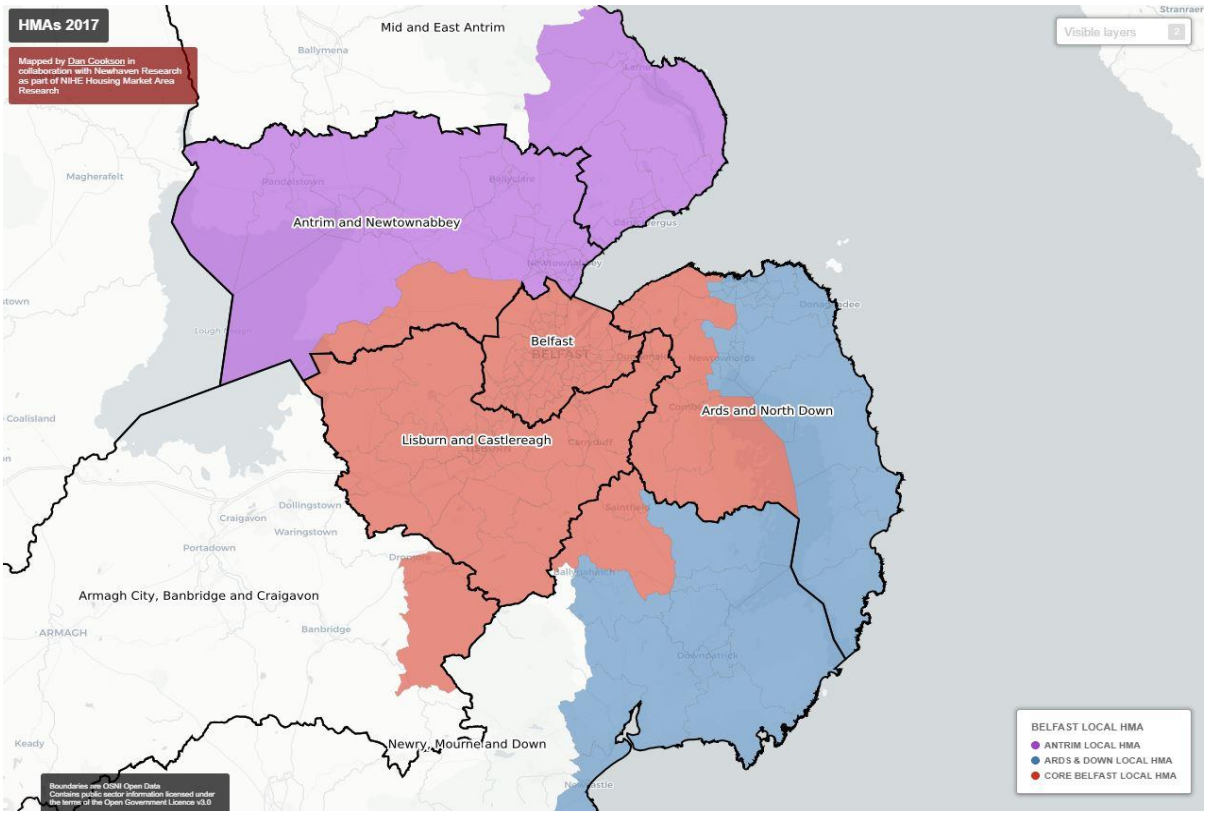
The internal spatial structure of a housing market area is complex and comprises of many different spatial layers. Our analysis suggests that the Belfast Metropolitan HMA has a two tier functional geography in the sense that it includes local HMAs that 'nest' within the broad HMA. These local HMAs are shown in figure ES2.

The remaining NI housing markets areas comprise of a single tier HMA. On saying that, the Craigavon HMA has two distinct and important spatial segments based around Armagh City and Banbridge town. Likewise the Derry HMA includes the distinct spatial segment of Limavady that is only modestly connected to the broader Derry HMA.

Comparisons between the 2007 and 2017 based broad HMAs confirm that changes to the 'outer shell' are very gradual. In terms of keeping the HMA boundaries under review, we would suggest that the main focus should be to watch for evidence that the 'outer shell' of the Belfast Metropolitan HMA or the spatial extent of its local HMAs are changing.

Data limitations continue to block attempts to investigate and map HMAs that might extend across the border into the Republic of Ireland. It would therefore be helpful for the NIHE to collaborate with NISRA and CSO to explore the scope to develop more robust, anonymised and routinely updated cross-border commuting and migration data that could be reported below local authority level and ideally down to SOA area and made more easily accessible for researchers.

Figure ES2: Local housing markets within the Belfast Metropolitan HMA, 2017 based



The NIHE plans to use the HMAs to produce revised and updated local housing systems analysis (LHSA) but it faces challenges in terms of both data availability and the resources required to perform the task effectively. We believe a suitable way forward would be to view the LHSA as an ongoing process and for the NIHE to liaise with local authorities to:

- Identify the most pressing issues that warrant investigation and are also practical to achieve in light of data availability.
- Prioritise key data gaps and then work in collaboration with NISRA, the Department for Communities, Cache and data providers to agree the best way forward to close these data gaps.

Some important data gaps at local level include the provision of routinely updated data on private and housing association rents, the characteristics and financial circumstances of households in different tenures, lettings to homeless applicants and co-ownership purchases. Feedback from the workshops also suggests there are issues around effective land supply and ownership.

Finally, it would be advisable for the NIHE to conduct further discussions with local authorities and other stakeholders about the planned use of HMA boundaries and, more specifically, about the potential delineation of local HMAs and sub-areas for the Belfast Metropolitan HMA.

All mapping in this project was carried out by Dan Cookson in collaboration with Newhaven Research. The full set of HMA geographies can be accessed here: j.mp/HMA2017_Map

1. Introduction

Background

Household decisions about where to live are typically shaped by personal circumstances, the characteristics of a property and its surrounding neighbourhood and the cost of house purchase or rent as opposed to local authority boundaries. As a result, analysis that is restricted to a single local authority area, especially in metropolitan areas, can led to misleading conclusions about future housing development requirements, affordability pressures and other imbalances in the housing system. This is why economists have long argued that the spatial extent over which the broad housing market functions is the most appropriate starting point for analysing local housing systems and how policies shape housing outcomes (Maclennan et al, 1987; Cullingworth, 1997; and O' Sullivan et al, 2004).

In the last two decades policy makers have increasingly recognised that the delineation of housing market areas (HMAs) can make for better policy decisions and can help to ensure that analysis of local housing systems is better attuned to the factors that drive housing costs, household mobility and tenure choice and thus give rise to housing need and demand. In line with this trend, the Northern Ireland Housing Executive (NIHE), in its capacity as the strategic housing authority, commissioned a study to provide a suitable spatial framework to support its housing analysis and strategy development (Young, et al, 2010). The original study was based primarily on an analysis of residential mobility during the economic and housing market boom years from 2004 to 2007. Since then, the housing market has experienced a great deal of turmoil. With the publication of Census 2011 flows data and the updated Travel to Work Areas (TTWAs), the NIHE concluded it was appropriate to revisit the geography of Northern Ireland's housing market areas.

Study purpose

This overall aim of this study was to prepare an updated set of functionally-based housing market area boundaries for Northern Ireland that takes account of 2011 based Travel to Work Areas (TTWA) and data that have become available since 2011, including Census data. The objectives of the study, which began in February 2018, were to:

- Update the functional HMAs to reflect recent residential movement patterns, where possible refining the method used to define the 2009 based HMAs to take account of any methodological advances and improvements in data availability.
- Compare the HMA boundaries with the 11 local authority boundaries and offer advice on a pragmatic approach to future analysis and reporting of local housing systems, taking into account resource and data availability.

Study approach

Figure 1.1 summarises the overall study approach and illustrates that the four month project involved several inter-linked tasks:

- A review of research and policy evidence from the UK and the rest of Europe on the concept, delineation and use of functional economic areas, with particular reference to housing markets and the functional areas that extend across national boundaries.

- The refinement of an appropriate method to define a set of functional HMAs for Northern Ireland that could be employed using readily available data.
- An analysis of Medical Card Registrations (MCR) data, 2011 Census flows data and other evidence to explore patterns of commuting and residential mobility and to appraise the strength of functional housing market relationships between Northern Ireland's main economic centres, other settlements and rural wards. In terms of the latter, of particular interest were residential flows of adults between the ages of 25 and 64 years.
- Extensive consultation with stakeholders to explore whether the functional HMAs derived from the data analysis were broadly in line with local understanding of the spatial make up of housing markets and to seek views on the merits and risks of aligning the HMA boundaries to those of local authorities. In addition to a programme of phone interviews, four external stakeholder workshops were convened to give representatives from the local authority, academic and wider housing professional sectors the opportunity to comment on emerging findings before the report was drafted. A workshop was also held with NIHE staff.

A fuller description of the technical components of the study and the steps taken to analyse the statistical data and plot the HMA boundaries can be found in Section 4 and Appendix 3.

Report Structure

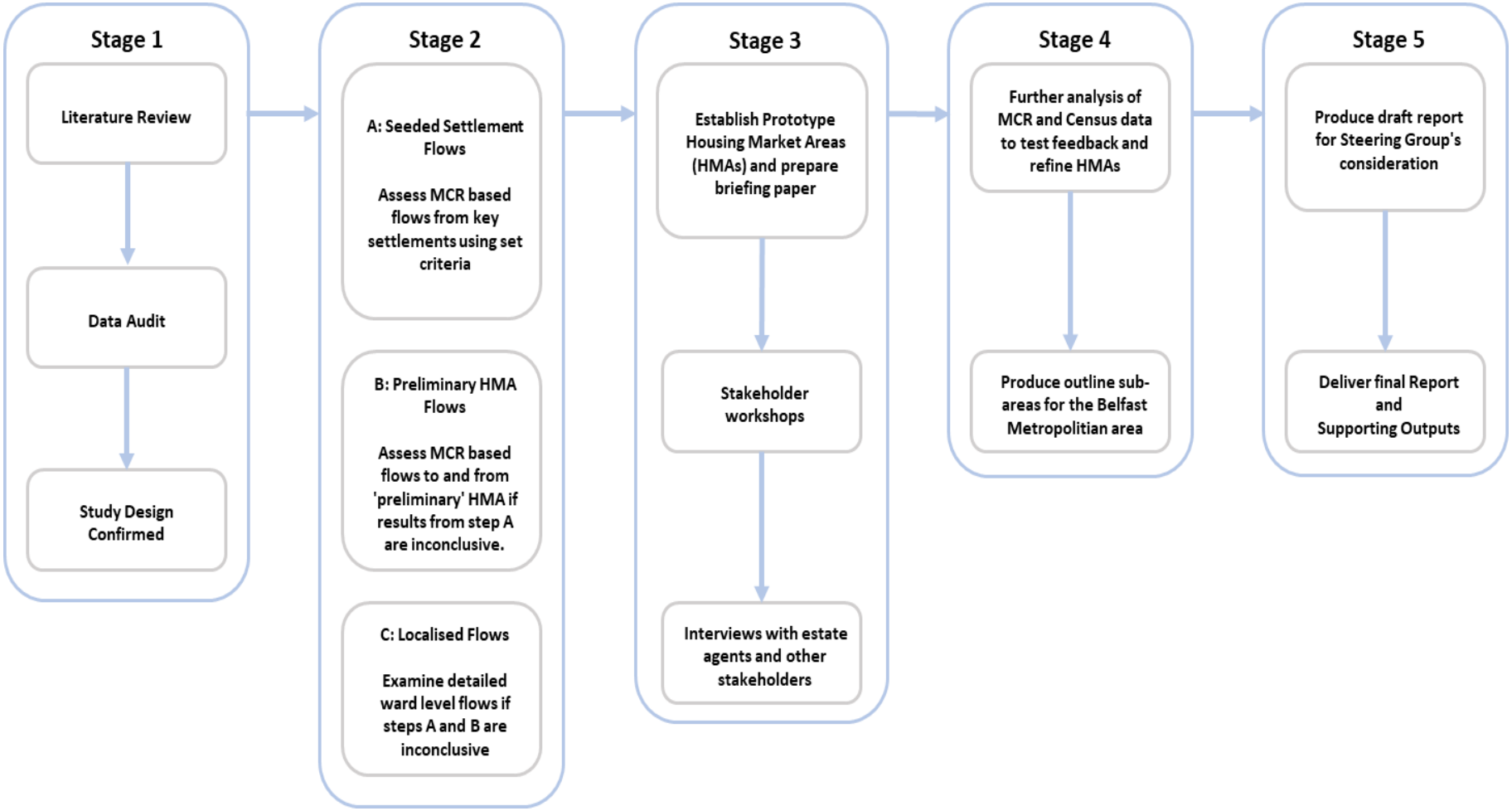
The rest of the report is structured into five further sections:

- Section 2 discusses the concept of a housing market area (HMA), why the delineation of HMAs are important for those engaged in housing planning and policy-making and available methods to define the spatial extent of HMAs.
- Section 3 reviews recent trends and dynamics in patterns of residential movement within Northern Ireland that have influenced the evolving structure and spatial extent of housing markets areas.
- Section 4 sets out our proposed specification for the broad HMAs and considers the relationship between these functional HMAs and local authority areas.
- Section 5 sets out our conclusions and recommendations, including high-level advice on analysing the operation of housing markets in Northern Ireland.

The report also contains a number of appendices:

- Appendices 1 and 2 review the potential methods for defining an HMA plus a full description of the study method. This includes a technical exposition of the method used to analyse MCR data to delineate each HMA.
- Appendix 3 provides an inventory and audit of potential data sources.
- Appendix 4 includes a list of the names of individuals who generously gave of their time to participate in this study and a copy of the workshop slides.
- Appendices 5 and 6 set out a number of supporting tables that summarise Census 2011 migration and commuting flows plus outputs from our analysis of the anonymised MCR dataset supplied by Business Services Organisation (BSO) to inform this study.

Figure 1.1: 2018 Northern Ireland Housing Market Area Study approach



2. The concept, relevance and delineation of Housing Market Areas

The concept of a housing market area (HMA)

Markets function where buyers and sellers come together to trade goods and where the price mechanism is the means by which demand and supply are gradually brought into balance. Housing markets have a strong spatial dimension. Not only are dwellings immobile but most households seek a suitable home within reasonable proximity to their place of work, their family and their wider social network (O'Sullivan et al., 2004). The structure and operation of the housing market influences the productivity of local economies and property values and thus the distribution of wealth (MacLennan et al, 2015). It also influences the life chances of individuals and families and patterns of social and spatial segregation (Bolt et al., 2010). Understanding the functional geography of housing markets is therefore a vital step in analysing housing systems.

The concept of a Housing Market Area (HMA) grew out of the access-space model proposed by Alonso (1964) and Muth (1969). It is based on the idea that the house prices, land values and population densities all decline as the distance from the city centre increases. Other things being equal, households make a trade-off between the cost of occupying a home close to work (access) and the cost of living in a larger home in outer areas (space), after allowing for commuter costs (expenditure and time). The access-space model implies that the geography of local labour markets and housing markets are linked and that over the long run, earnings shape housing demand and house prices (Jones, et al, 2010). Thus, the spatial limits at which housing market processes function are shaped by the area over which most people travel to work (Hincks and Baker, 2012).

The housing market has come to be defined as the spatial area within which most households both live and work and where those moving house without changing their place of work search for, and choose, a home (MacLennan et al 1998; O'Sullivan et al 2004). A broad HMA is therefore an area where the vast majority of house moves take place within it rather than into it or out of it. This is especially in the case for home buyers and households of working age.

HMAs often extend across local authority boundaries and do not always have clear, rigid and coterminous boundaries. Adjacent HMAs boundaries can therefore overlap, especially in and around large urban areas. This feature is easily overlooked, often due to the preference of policy makers to have clearly defined boundaries, especially if these are simply aligned to local authority boundaries (Hincks and Baker, 2012). The idea of 'fuzzy boundaries' has therefore been used to counter the assumption that economic geographies have clear and rigid boundaries (Walsh et al, 2016).

The access-space model, like all economic models, it is a simplification of reality and outlines what an equilibrium spatial structure would look like in the long run under ideal conditions. In the real world, HMA boundaries change over time and space (O'Sullivan et al, 2004) as consumer preferences and behaviour adapt to changes in labour and housing market conditions, transport infrastructure and policy developments.

The access-space model also infers that the delineation of HMAs should take account of 'spatial arbitrage', which implies that the price of housing in a given area should trend towards uniformity in the long run as a result of competition (Jones, et al, 2010). However, HMAs are rarely, if ever, in equilibrium in the sense that the law of one price holds across the whole housing market or that

rising house prices lead to a corresponding increase in new supply (Meen 2012). There are many reasons why this might be the case but three stand out:

- Homes vary in shape, size and age and are situated in neighbourhoods with different attributes. These features all shape consumer search behaviour, albeit their importance relative to access to work and proximity to social networks in driving residential mobility and house prices is unclear (Green, 2018).
- Housing systems are not wholly market driven. New housing supply is regulated through the planning system and influenced by government funding and policy mechanisms as well as the behaviour of, and relationships between, the various public and private agents involved in the supply chain (Hincks and Baker, 2012).
- The interaction between the social and private housing sectors. This affects the functioning of the housing system, although precisely how is not well understood (Gibb, 2013).

The upshot is that the internal structure of a HMA is anything but homogenous. Beneath this 'outer shell 'of the broad HMA is a patchwork of administrative and functional geographies (Young et al, 2010). A HMA is therefore best viewed as a tiered entity, with large urban housing markets often comprised of three tiers. These include local HMAs that nest within the broad HMA and sub-markets that nest within a local HMA (Jones et al, 2010). Beneath the broad HMA (and local and sub-market areas where they exist) there are often other spatial units of interest such as settlements and neighbourhood renewal areas.

Typically, the boundaries of broad HMAs gradually evolve, whereas the boundaries of local HMAs and sub-markets are more volatile and responsive to changes in local conditions such as rising prices or major new housing developments.

The broad HMA is the appropriate spatial basis for analysing the economic, demographic and social drivers of housing demand[1] and the responsiveness of existing and new housing supply to changes in aggregate demand. In other words analysis of the interconnections between these external forces and the supply and consumption of housing can enhance understanding of how well a housing system is functioning and why certain imbalances exist. This in turn can help to inform policies that seek to shape the volume and mix of housing available. However, analysis to better understand inequalities in the distribution of housing and attendant problems of affordability and housing stress usually requires a finer grain of analysis reflecting the lower spatial tiers within the broad HMA.

Housing system processes also appear to be becoming more complex. The growth in dual earning households has been accompanied by the suburbanisation and the decentralisation of households, businesses and services to the outskirts of the built up area and nearby rural areas (Jones, 2017). As a result, commuting and housing search patterns have become more varied, with more cross-commuting between urban centres, suburbs and rural areas, which may in turn have deepened the extent of overlapping and fuzzy boundaries (Hincks and Wong; 2010, Hincks and Baker, 2012).

[1] These drivers include population growth, migration, household formation, incomes, earnings and house prices/ rents.

Housing market areas and the housing planning and policy processes

As HMA boundaries can extend across local authority boundaries, policies to ease supply-side constraints by one local authority may have little effect on house prices and the overall requirement for housing unless they form part of a co-ordinated approach to ease constraints across the broad HMA. In recognition of this, Scottish local authorities have been tasked with defining and using HMAs to inform plans for the development of both market and non market housing for the best part of four decades (Maclennan et al, 1998; Jones, 2002; O'Sullivan et al, 2004).

Policy interest in HMAs elsewhere in the UK gathered pace with the emergence of spatial planning. After 2003, a succession of official guidance across Britain has called on local authorities to work together to understand the spatial level at which the broad housing markets function, the processes that shape them and their implications for future housing development (Ferrari, 2011). The perceived benefits of defining HMAs articulated in guidance documents are summarised in Table 2.1.

Table 2.1: Ways in which defining HMAs may support strategy and policy processes

Gain a more complete understanding of the nature, extent and distribution of housing demands and needs	Using HMAs to frame analysis: • Can improve spatial awareness and understanding of the balance between housing supply, demand and need within the housing system. • Can help ensure estimates of the aggregate 'requirement' for housing pay more attention to house prices and other signals of market conditions. • Can encourage local authorities and their partners to pool resources to share and process data to create an evidence base that one or more LAs can use to analyse issues at different spatial scales.
Promote joint working	• HMAs provide a suitable spatial scale for joint working to assess the aggregate current and future housing requirement for market and subsidised housing. • An HMA focus can incentivise local authorities to look beyond governmental boundaries in order to address strategic issues of common concern with other local authorities and other stakeholders. • HMA geographies provide a platform for local authorities to collaborate in liaising and negotiating with developers, government departments and their agencies.
Support policy development	• The HMA framework can help ensure plans and polices are attuned to the housing market and the diversity of consumer motivations for house purchase, tenure choice and household mobility. • An HMA focus can reduce the risk of co-ordination failures by enabling the development of mutually reinforcing policies. • A co-ordinated approach at HMA level can reduce the risk that plans and policies generate negative 'spillovers' or unintended negative impacts.

Recent developments in England and Scotland

Since the 2010 UK election, the English spatial planning system has been through several changes, with the latest proposals set out in the draft National Planning Policy Framework (NPPF) and accompanying draft Planning Practice Guidance (PPG) issued in March 2018. The draft NPPF consolidates proposals outlined in previous consultation documents[2] and includes a requirement for local authorities to produce a 'statement of common ground'. This aims to strengthen the 'duty to

[2] This includes proposals consulted on in the Housing White Paper and Planning for the Right Homes in the Right Places.

co-operate' and will require local authorities to document how they have worked together to address housing needs and other cross-boundary issues. The draft PPG details a standardised approach for projecting housing requirements and restores top-down housing delivery targets.

Time will tell if the overall package of proposals will facilitate the delivery of 300,000 homes per year, increase affordable housing and overcome the strategic planning vacuum created by the abolition of regional planning bodies in the wake of the Localism Act 2011. In the meantime, official guidance continues to place strong emphasis on the use of HMAs to frame housing systems analysis and to inform planning for housing. The Ministry of Housing, Communities & Local Government on-line guidance on economic development needs assessments (2015) states:

> *"Local planning authorities should assess their development needs working with the other local authorities in the relevant housing market area or functional economic market area in line with the duty to cooperate. This is because such needs are rarely constrained precisely by local authority administrative boundaries"*[3].

The spatial planning framework in Scotland is also being revised. Amongst the many aims of the Planning (Scotland) Bill are to ensure local authorities continue to collaborate in providing evidence and analysis in relation to infrastructure, housing and other cross-boundary issues. Plans to revoke Strategic Development Plans for the four city-regions and replace it with regional partnerships and a 'duty to co-operate' have, however, been strongly criticised by the parliamentary Local Government and Communities Committee (2018). The Scottish Government also wants to streamline the housing needs and demand assessment process. At the time of writing, however, it had yet to clarify what this would mean in practice.

Northern Ireland policy context

In Northern Ireland, the importance of functional linkages was signalled in the Northern Ireland Regional Development Strategy: Shaping Our Future (DRDNI, 2002). It outlined a vision for a more spatially connected, socially cohesive, economically competitive and outward looking Northern Ireland. Its strong emphasis on 'connectivity' was expressed in terms of 'hubs', 'gateways' and 'corridors' to show how rural and urban communities might mutually benefit from sustainable development[4]. The revised RDS 2035 continued this theme, refocusing the hub concept to more clearly differentiate between principal cities (Belfast and Londonderry) and sub-regional centres based on either a single economic centre or a cluster of settlements. From a housing development perspective, however, the clearest articulation came in the Strategic Planning Policy Statement (SPPS) for Northern Ireland (2015).

The Planning (NI) Act 2011 introduced a two-tier planning system and transferred responsibility for Local Development Plans to the 11 local authorities that were established in 2015. In line with the RDS focus on sustainable development, the SPPS advised local authorities that:

> *"In furthering sustainable development it is important to manage housing growth in a sustainable way, placing particular emphasis on the importance of the inter-relationship between the location of local housing, jobs, facilities and services, and*

[3] https://www.gov.uk/guidance/housing-and-economic-development-needs-assessments#scope-of-assessments

[4] This spatial vocabulary was derived from the European Spatial Development Perspective (EC, 1999).

infrastructure" Strategic Planning Policy Statement for Northern Ireland (2015), paragraph 3.5, p12

The SPPS therefore inferred that in developing their Local Development Plans and identifying suitable sites for housing, local authorities need an understanding of the broad HMA within which their area is located. More recently, the NI Chief Planner (2016) has stressed the importance of collaboration between local authorities and reiterated that the Independent Examination of Local Plans will seek to ensure cross-boundary issues have been addressed.

Spatial planning has also been pivotal in increasing awareness of functional economic linkages across the Island of Ireland and in fostering joint working. Since 2001 the national spatial plans for the North and South of Ireland have moved closer together and now share common goals on issues such as improved infrastructure and economic growth. Both plans also recognise the North West as a functional economic area. The National Development Plan 2018—2027 (NDF 2027) states that "*Letterkenny, with Derry City and Strabane, functions as a cross-border city region" (p 29).* Similarly, in a 2017 'agendaNi' article, the NI Chief Planner stated the North West region encompassed "*Derry/ Londonderry, Strabane, Limavady and across the border into Donegal.*"[5] Both the RDS 2035 and NDF 2027 also note cross-border linkages exist in the Newry-Drogheda-Dundalk area.

European interest in functional economic areas

Both the EU and the OECD (Organisation for Economic Co-operation and Development) have a strong interest in spatial processes and see a strong policy focus on functional economic areas as a means to enhance the economic competitiveness and social cohesion of both 'city-regions' as well as 'polycentric urban regions' that have two or more cities rather than a dominant centre, such as the Rhine-Ruhr region (EC, 2007; Gleeson, et al, 2010)[6].

The INTERREG programme has facilitated cross-territorial co-operation in Ireland and elsewhere in Europe through funding the development of data infrastructure and applied research to improve the evidence available to support spatial planning. The EU has also promoted work to define functional economic areas (FEAs). This work was initially funded under the auspices of the European Spatial Development Perspective (ESDP) and the European Spatial Planning Observation Network (ESPON). Due to data limitations, these initiatives typically relied on ad-hoc and pragmatic approaches, such as amalgamating administrative areas. Following calls for greater consistency in defining FEAs that took account of connectivities between urban and rural areas (Coombe et al, 2012; Creamer et al. 2016), Eurostat has recently piloted an open source IT solution for defining local labour market areas (LLMAs) that has built on the TTWA used in the UK (Eurostat, 2015; Franconi et al, 2017).

Cross-border flows and functional economic areas

Schack (2000) has observed that Europe's border-regions have over-lapping borderlines. Political borders are the most visible borders and demarcate one country from another, with different

[5] http://www.agendani.com/planning-for-regional-growth

[6] The promotion of functional geographies was one of the factors behind the creation of the 2012 OECD-EC harmonised definition of city urban areas based on commuting zones (Dijkstra & Poelman, 2012) and the 2014 EU three fold spatial classification known as DEGURBA (Dijkstra & Poelman, 2014). This defines densely, intermediate and thinly populated areas (for which read cities, towns/ suburbs and rural). These are intended to enhance the reporting of economic and labour market data and complement the NUTS territorial classification, which is based on administrative areas.

institutions, laws, tax regimes and social security systems operating on either side of the border. Economic borders involve activities such as commuting, residential mobility and shopping[7] and often extend across political boundaries. Social and cultural borders typically involve a common language, a shared history and sense of identity but can be very fuzzy and difficult to define with any precision.

European research has primarily explored the factors associated with cross-border mobility and the production of typologies that classify areas according to the nature and impact of cross-border mobility rather than the spatial extent of cross-border areas. Wiesböck and colleagues (2016) synthesis of this body of research found that aside from spatial proximity to the border, the propensity of people to engage in 'trans-migration' is shaped by the institutional framework of neighbouring countries, the existence of good transport links, long standing cultural and economic ties and a common language. They also found that a person's socio-economic characteristics, attitudes and social networks played a role, with the presence of family and other social networks in the adjoining country increasing the likelihood of residential mobility. This lends support to a small study on commuting flows across the Irish border (Shuttleworth, 2007), which suggested that the socio-economic characteristics of households (but interestingly not necessarily community background or national identity) seemed to help explain cross-border flows.

Nevertheless, the most important push and pull factors appear to be structural disparities in labour and housing markets on different sides of a border, especially wages rates[8] and house prices. In particular, residential mobility appears to be strongly influenced by the ability of households to exploit differences in house prices between their country of work and their country of residence. For instance, two separate studies found that local housing shortages and rising prices led to an increase in the number of Dutch people relocating to villages just across the border in Germany while generally maintaining their jobs and much of their social living in the Netherlands (Strüver, 2005; Van Houtum and Gielis, 2006). Likewise, Jagodic (2016) found that Italians that had moved to villages inside the Slovenian border continued to commute to Trieste in Italy for work and for socialising.

Households can also adapt their behaviour in response to changing local market conditions. In Ireland, for instance, people change which side of the border they shop in response to local prices and changes in exchange rates. Although evidence is limited, this adaptation process seems to extend to housing. Van Houtum and Gielis (2016) found that when house price differentials between Germany and the Netherlands changed in the late 1990s residential mobility flows in the cross-border area between the two countries also changed direction.

European studies that have sought to define cross-border HMAs are lacking whilst studies to 'map' cross-border local labour market areas have been constrained by shortcomings in available data. These problems were highlighted by an exercise to test the EUROSTAT funded LLMA tool in the Netherlands-Belgium-Germany border area. Schmitt and Van der Valk (2017) had to impute "fictionalised" data for 'place of origin' as only the 'country of origin' of cross-border commuters was available. They also found that data for each country varied in terms of the basic spatial measurement unit and the definition of worker. The German commuting data counted employees and self-employed people whereas the Dutch and Belgian datasets counted employees only.

[7] Terms used in Europe to refer to cross-border commuting and/or residential mobility include circular mobility, 'trans-migration' (Strüver, 2005) and elastic migration' (Van Houtum & Gielis, 2006).

[8] One study found that German commuters were attracted to work in the construction and transportation sectors in Denmark because it paid higher wages and offered better working conditions (Buch et al, 2009).

Approaches to defining the spatial extent of HMAs

The three most commonly applied approaches to define HMA boundaries entail:

- The use of Travel to Work Areas (TTWAs) as a 'proxy' or close substitute for a broad HMA.
- The analysis of migration (or commuting) flows to identify areas with a high degree of self-containment, such that very high proportions of moving households' origins and destinations are contained within a specified boundary.
- The analysis of centre to periphery migration (or commuting) flows (in one or both directions). This typically involves identifying a settlement (seed point) likely to be at the core of a housing market area and applying a set of rules to assess the strength of interaction between the core settlement and surrounding settlements and rural areas.

Each approach has its strengths and limitations (see Appendix 1) and academic investigations have not conclusively demonstrated that any single method or dataset generates consistently more robust outputs in different urban and rural territories. However, we did identify several issues that shaped the detail of our approach to defining the 'outer shell' of the broad HMA, which are summarised below.

Available evidence strongly suggests TTWAs cannot be used as the sole basis for defining HMAs. The geography of HMAs and local labour markets are inter-linked but it is dangerous to simply assume the two geographies are always more or less identical (Young, et al, 2010; Jones et al, 2010). TTWAs are derived from the commuting flows of all adults aged 16+, including students in employment, which may differ from the commuting patterns of household representatives. Commuting and residential flows in rural areas in Northern Ireland have also been shown to differ somewhat, reflecting the strong attachment people have to the area in which they grew up (see Section 3).

In practice the selection of a suitable 'flows based' method (or combination of methods) depends on the local level data that is accessible to support analysis plus the resources available to conduct the analysis. However, the use of centre to periphery flows approach is more closely associated with 'mono-centric' urban territories such as Northern Ireland and Scotland where larger urban areas are based around a single dominant settlement and are spaced at some distance from each other.

Putting either of the two 'flows based' methods into operation invariably involves judgement. There is no 'natural level' at which 'closure' rates (i.e. the proportion of movers who both start and end within the same area) signifies a housing market is self-contained (Jones, et al, 2010). There are also no established rules for testing the strength of linkages between two areas or for selecting seed points. On the other hand there is broad agreement that:

- The basic spatial building block should be as small as possible to ensure functional boundaries are not constrained to local authority boundaries.
- Migration flows are influenced by student flows, which are not directly relevant to the process of defining HMAs. To allow for this analysis is usually limited to movers aged 25 years and above.
- There is a need to set a minimum population (or household) threshold to avoid inadvertently misclassifying smaller and inherently more volatile areas such as sub-markets and other spatial segments as HMAs (Hincks and Baker, 2012). This can in part be achieved by setting a

minimum population threshold, such as 10,000, for the settlements selected as seed points (Jones, 2002; Young, et al, 2010).

- Any policy decisions to align HMAs to local authority boundaries should be taken only after functional HMAs have been defined so that the resulting trade-offs can be made explicit.

English guidance has suggested house prices could be used to define HMAs, presumably in recognition of the concept of spatial arbitrage. However, Jones and colleagues (2010) found that house price hedonics did not prove very useful and concluded that migration and commuting flows should be the primary consideration for defining HMAs. In other words, house price mapping and the collation of the expert views of estate agents (and other housing professionals) appear be more appropriate sources for defining sub-markets (Pryce, 2013; Jones et al, 2010; Keskin and Watkins, 2017). In any case, robust data detailing all house sale transactions in Northern Ireland down to small area level over a period of many years is not readily available.

Implications for our approach to defining broad HMAs

Census migration and/or commuter flows data have been frequently used to map HMAs. However, the steering group agreed from the outset that this study would primarily (but not solely) be based on an analysis of Medical Cards Registrations (MCR) data supplied by BSO because:

- It provides the large volume of records required to analyse inter-ward residential flows. The MCR dataset contains 1,020,256 valid records for people of all ages that changed address in the period from January 2011 to October 2017 whereas the Census snapshot is based on 150,484 people aged 1+ that moved within (125,718) or to Northern Ireland (24,766) from the rest of the UK or aboard in the 12 months prior to Census day,
- The volume and direction of migration flows can vary over the economic cycle. There is therefore a risk that data for a single year of migration flows may under estimate or over state the extent to which the spatial extent of a HMA is changing. The MCR dataset, which is based on over 6.5 years of residential movements, should go some way to reduce this risk.

There is much discussion, especially in European policy circles, around the notion of polycentric urban regions and an implied shift away from a central place hierarchy associated with the access space model. However, both the RDS 2035 spatial framework and the 2011 TTWA profile suggest that Northern Ireland has a relatively widely spaced settlement pattern and that both urban and more rural areas are served by important economic and service hubs. This is consistent with the use of a 'seed point' approach to appraise the strength of residential flows between core settlements and surrounding areas as a major input into defining broad HMAs[9].

TTWAs cannot be assumed to be a close substitute for a broad HMAs, but the links between commuting and residential mobility mean it is important to compare migration and commuting patterns. We therefore used the 2011 TTWAs alongside analysis of Census 2011 commuting and migration data, to cross-check and if necessary refine the results from our main MCR analysis.

[9] It is also reassuring because timescale and resources available for this study meant it was not possible to secure access to the necessary data (such as Census 2011 SOA or ward level data for household reference persons that moved home) or develop and apply a complex and iterative algorithm such as the developed and refined by Newcastle University.

Today, more than ever, there is much policy and academic interest in the functional nature of cross-border economies. However, as in the rest of Europe, long standing difficulties in accessing and matching commuting and migration flows data at the small area level for the North and South of Ireland continue to prevent work to establish and map the spatial extent of cross border HMAs or other functional economic areas.

Finally, in all the studies we have reviewed, HMA boundaries have been coterminous and non-overlapping. This is a feature of the technical rules set to define HMAs as opposed to the realities of how HMAs function. In recognition of this, in analysing MCR data to define our prototype HMAs, we deliberately sought to identify any significant and sizeable areas subject to the influence of two or more broad HMAs.

3. Patterns of residential mobility across Northern Ireland

Introduction

Internal migration is the term used to describe people who already live in a country and move around each year. This section provides a brief overview of recent patterns of residential movement in Northern Ireland in order to provide context for the discussion of migration flows and the spatial composition in the rest of this report.

Changes in the numbers and profile of internal migrants

Table 3.1 shows that Northern Ireland's population has increased to over 1.86 million, mainly as a result of an increase in the population aged 35 years and upwards. On the other hand, internal migration within Northern Ireland has fallen back. Between 2001 and 2011 the numbers of people (aged one year and over) that changed address within Northern Ireland in the year prior to the Census fell from 138,436 to 125,718.

Table 3.1 Population of Northern Ireland split by age group, 2001-2016

	2001		2011		2016	
	Count	**Percent**	**Count**	**percent**	**Count**	**Percent**
19 and under	500,218	29.6	481,271	26.5	483,978	25.9
20-24	109,494	6.5	125,046	6.9	118,744	6.4
25-34	242,310	14.3	245,724	13.5	247,875	13.3
35-49	351,337	20.8	384,843	21.2	370,263	19.9
50-64	261,389	15.5	311,672	17.2	343,522	18.4
65-79	170,167	10.1	197,457	10.9	221,551	11.9
80+	53,923	3.2	68,305	3.8	76,204	4.1
All	1,688,838	100	1,814,318	100.0	1,862,137	100
Source: NISRA population estimates, accessed May 2018						

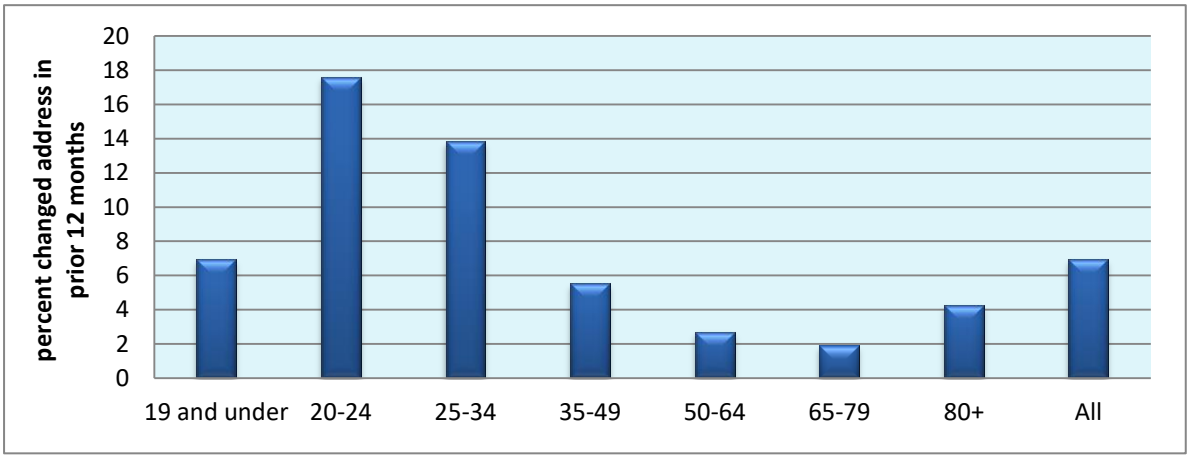
It is safe to assume that one reason for the decline in internal migration has been changes in the age and composition of the population. Figure 3.1 shows, the propensity to migrate declines sharply after the age of 35 until later life. There is also a considerable body of research evidence which has found that rates of residential movement vary over the life course, as do the reasons for moving (Green, 2017). Hence, the U shape curve in Figure 3.1 is associated with:

- The movement of young adults to pursue education and training opportunities as well as the movement of graduates to pursue work.
- The decline in residential moves once households have established a home and accumulate domestic responsibilities such as child rearing that make residential mobility a more complex and costly process, especially for dual earning households (Coulter and Scott, 2015).
- Moves in later life in response to a greater need for care or to be within closer proximity of family.

Comparisons between the 2001 and 2011 Census suggest that younger adults are moving more frequently and for an extended period of time, reflecting the increasingly fuzzy transition to adulthood and the increased tendency for younger adults to make multiple moves back and forth

from the parental home prior to establishing their own stable household (Green, 2017; Sage et al, 2013). At the other end of the spectrum, some households are migrating much less, including some groups of households that have traditionally been less mobile. This indicates that in addition to life-course stage, a web of economic, social and technological processes shape where, when and why households embark on a residential move.

Figure 3.1: Propensity to move within Northern Ireland by age, 2011 (%)



Source: Census 2011: Table MU01BUK: Origin and destination of migrants by age (grouped) accessed via NOMIS May 2018

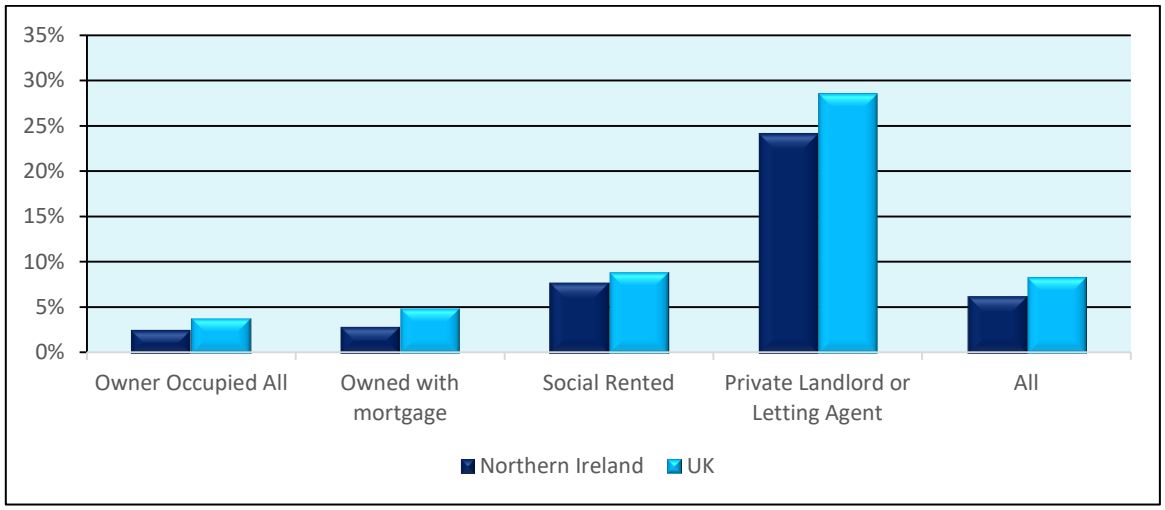
It is beyond the scope of this project to explore the processes that drive internal migration but it is clear that one such process has been the global recession and its ongoing impact of the operation of the housing system. There is a paucity of research on how the fallout from the recession has been redrawing the movement patterns of households in different tenures but our empirical observations and discussions with some stakeholders suggest that after allowing for age and composition:

- Residents of social housing in Northern Ireland have not become significantly more (or less) mobile since 2001.
- Private renters have become more mobile throughout the UK. In the case of Northern Ireland this seems to have been mainly due to a growth in the number of moves that take place over shorter distances. The upward shift in the mobility of younger adults is interwoven with the growth in the numbers of people that now rent privately.
- Fewer homeowners are moving house, particularly those buying with a mortgage and that live in Northern Ireland (see Figure 3.2).

The decline in residential mobility amongst homeowners may be linked to the rise in longer distance commuting in Northern Ireland[10]. The lack of house price growth, the lack of wage growth and the persistence of negative equity are all likely to have encouraged homeowners to choose commuting as a substitute for internal migration. Stakeholders also suggested that in the absence of house price growth, which has historically offset the cost of moving house, homeowners have looked to improve and upgrade their current home rather than move.

[10] TUC estimates derived from the LFS data suggests that in 2016 some 53,000 people in Northern Ireland spent 2 or more hours commuting (two-way) to work, up by some 19,000 in 2010. However the numbers of longer distance commuters in NI is still low compared to the rest of the UK.

Figure 3.2: Individuals in 'wholly moving households by tenure (%)



Source: UKMIG011 - Household migration by tenure, accessed NOMIS, May 2018

Spatial variations in population turnover and churn

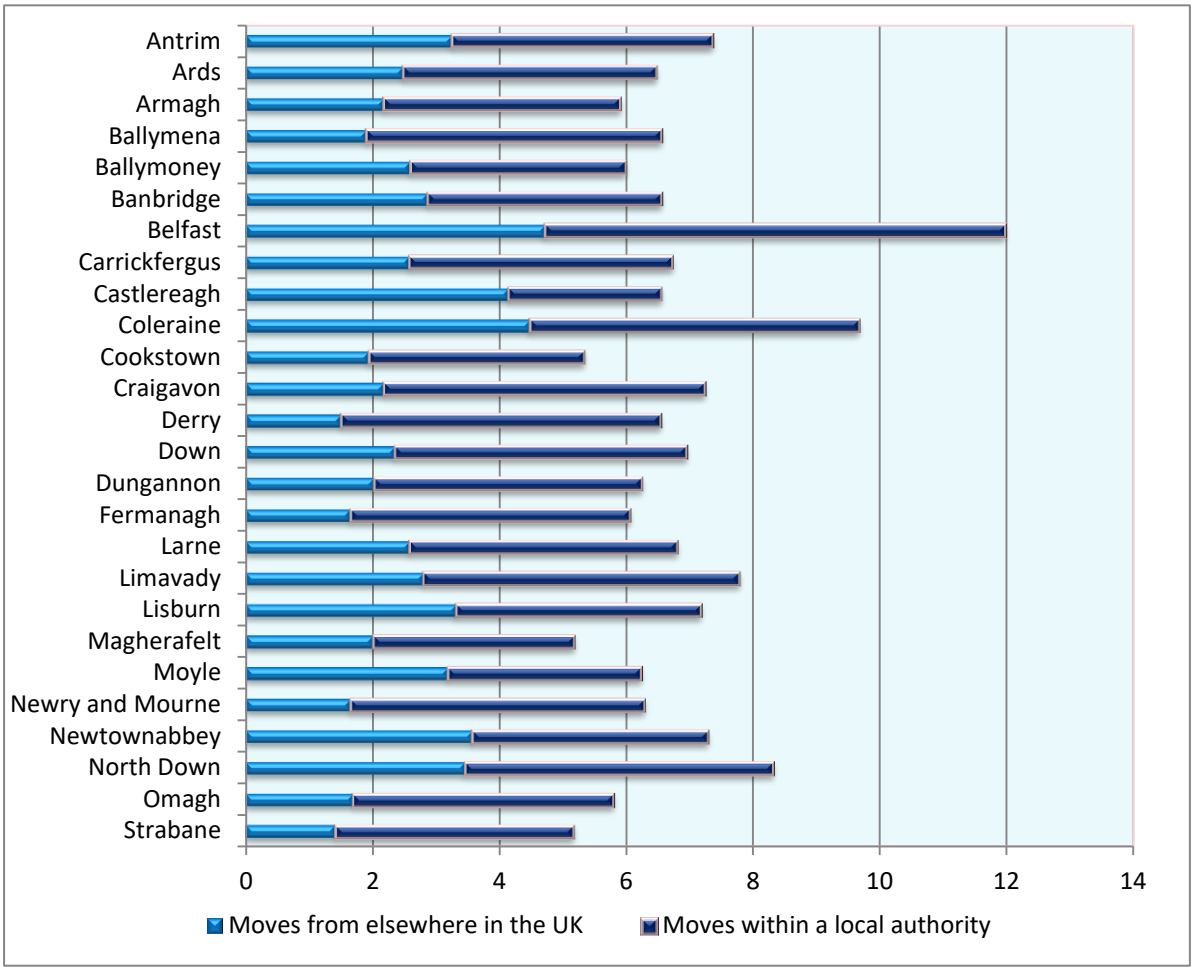
According to the 2011 Census, 136,892 residents had changed address in the previous year, of which 125,718 had moved within Northern Ireland and 11,174 had moved from Britain. Of these 136,892 people, 62% remained within the same local government area, 30% had moved to another local government area and 8% had moved from another UK region. In the same year, 3,181 people had moved to Northern Ireland from Ireland. These figures collectively indicate that around 7.6% of Northern Ireland's residents move home each year, rising to 7.7% if people that move from 'the south' are included. Both rates of internal migration remain well below the comparable UK wide rate of 11%.

Low rates of population turnover are very much in evidence at the local level (see Figure 3.3). In 2011 Belfast and Coleraine were the only former local government district areas where the rate of population churn was above the median rate for all local authorities in the UK. Local areas with highest rates of population churn also tend to have higher rates of inter-district and inter-regional flows. Further analysis of census data relating to these longer distance residential flows show:

- People moving from Britain were concentrated in the Belfast Urban Area and in particular the former government districts of Belfast, Lisburn, Ards and North Down. The age profile of this sub-group suggests some of these moves involved people retiring back to Northern Ireland, especially in the case of Ards and North Down.
- Inter-district moves were concentrated in Belfast and Coleraine and to a less extent in Newtownabbey and Castlereagh and many of these moves involved student related migration by individuals under the age of 25.
- Residents aged 30 and upwards that moved to another local government district typically remained within a commutable distance of their previous address. In the case of Belfast, the vast majority had moved to somewhere within one hour's drive time from the City.

- Whilst the number of people moving to Moyle was low, it was evident that the area attracted people from Britain and the Belfast Urban Area as well as from neighbouring local authority areas.

Figure 3.3: Internal migration in the year prior to 2011 Census as a proportion of the usually resident population by local government district



Source: Data from census table MM01CUK_all via NOMIS
Note: The "rest of UK includes elsewhere within Northern Ireland

Moves in predominately rural areas

Residential immobility was a feature of rural and less densely populated local areas in 2001 prior to the housing market slump and this has remained the case. Figure 3.3 illustrates that in 2011 several former local government districts, including those west of the Bann, had rates of internal migration of 6% or less. Residents that live in rural areas also tend to move only short distances. For example, our analysis of MCR data found that 52% of moves within the Fermanagh area that involved people in the 25-64 age group started and ended in the same ward. This is close to double the rate for Northern Ireland as a whole.

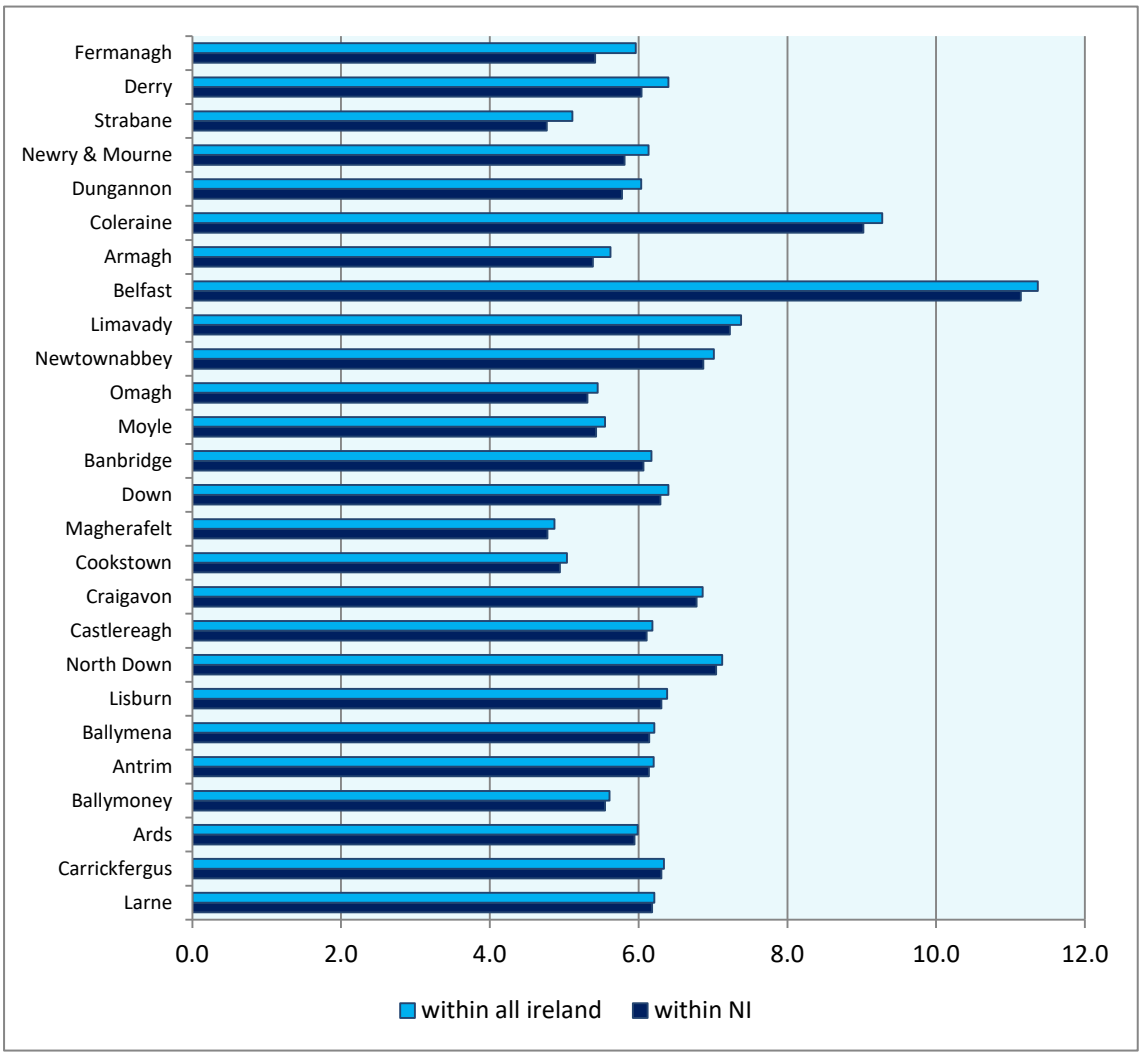
These patterns are consistent with research evidence that residents in rural areas are often 'rooted' to the area in which they grew up and that strong social and emotional ties to "their home" influence not only their propensity to move, but also their decisions about where to move to (Young

et al. 2012). For individuals and households that rely on family and social networks to 'get by' materially or to help with caring and other domestic responsibilities, geographical proximity is very important and acts as a deterrent to longer distance residential moves. As a couple of stakeholders observed, access to these forms of social capital is especially important at times of austerity and may have played some role in the decline in population turnover in both the north and south of Ireland.

Local population churn and cross border flows

CSO (2016) and NISRA (2014) estimates suggest there some 38,000 residents in Northern Ireland were born in the Ireland and some 57,000 residents of Ireland were born in Northern Ireland, with upwards of half of these residents live in administrative areas that adjoin the geo-political border. These stock figures reflect the long history of population flows across the Island of Ireland.

Figure 3.4: Internal migration rates inclusive and exclusive of people that moved from the ROI



Source: Census tables MM01CUK and MM01CUK_NON_UK - Origin and destination of international migrants by age and LGD: accessed via NOMIS

The annual flow of people that migrate across the border to live and the places they move to are more important from the perspective of this study but evidence offers only a partial and incomplete

picture.[11] Estimates exist for the numbers of people the travel across the border to work or shop but no-one is very sure how many people migrate across the border from one year to the next. NISRA (2017) has estimated that, on average, there are 1,500 long-term migration inflows each year from Ireland to Northern Ireland. This equates to half of the 3,181 inflow figure reported in the 2011 Census, which suggests that the latter includes a large pool of students and other transient migrants. Comparable estimates for long-term migration inflows from North to South could not be found but there is no reason to believe this flow would be of a radically different order of magnitude.

Residential inflows from Ireland have negligible impact on Northern Ireland's overall rate of internal migration. Whilst these inflows increase local rates of population turnover in the border area such as the former local government areas of Derry, Fermanagh and Newry and Mourne, their impact is very modest (see Figure 3.4). This reflects the fact that the numbers of 'migrants' recorded for each area is low. The 2011 Census reported that 392 people moved from Ireland to Derry in the previous 12 months compared to 515 people that had moved from Britain to Derry (see Appendix 5 Table A5.1).

Stakeholders were rightly cautious that Census data are not wholly representative of local dynamics as it only captures a single year's snapshot and does not capture the mobility patterns of individuals and families that maintain an address on both sides of the border. On the other hand, researchers from Maynooth University have suggested that short-distance migration between the two adjoining countries has been declining. This appears to be linked to the decline in the population of all three Irish counties that adjoin the border, especially in the 2011 to 2016 period.

Cross-border commuting

Whilst there is scant evidence to support (or refute) the existence of broad HMAs that extend across the geo-political border, there is stronger evidence to support the existence of other forms of functional economic linkages. This suggests people that live close to the border are far more likely to commute than to migrate.

Table 3. 2: Origin and destination of cross border workers and students, 2016

	(Destination)						
County or origin	**Armagh**	**Antrim**	**Down**	**Derry**	**Fermanagh**	**Tyrone**	**Total**
Donegal	21	252	33	4,256	131	915	5,608
Monaghan	533	97	89	21	154	218	1,112
Louth	410	128	350	15	2	21	926
Cavan	33	19	12	9	396	24	493
Dublin City	23	81	37	15	2	19	177
Leitrim	3	10	1	4	113	17	148
All other counties	123	345	153	87	79	85	872
Total	1,146	932	675	4,407	877	1,299	9,336
Source: CSO, 2016 Irish Census							

[11] Evidence on the flow of people that have migrated from Northern Ireland to Ireland is lacking and we found no credible data relating to people that maintain an address on either side of the border.

Table 3.3: Origin and destination of cross border workers, 2011

	(Destination)													
	Dublin City	South Dublin	Fingal	Dun Laoghaire-Rathdown	Kildare County	Louth County	Meath County	Leitrim County	Sligo County	Cavan County	Donegal County	Monaghan County	Ireland - Other	Total
Newry, Mourne and Down	218	38	82	32	17	747	53	2	0	7	8	107	438	1,749
Fermanagh and Omagh	48	7	18	10	6	13	4	59	65	345	199	243	277	1,294
Derry City and Strabane	21	7	5	4	8	6	1	0	2	3	855	6	310	1,228
Armagh City, Banbridge and Craigavon	75	13	39	17	3	124	16	0	1	22	7	233	162	712
Mid Ulster	37	5	9	11	8	18	8	2	2	12	11	119	114	356
Belfast	66	12	15	21	4	23	6	0	1	1	6	2	81	238
Lisburn and Castlereagh	41	5	13	8	4	13	0	0	0	1	4	5	46	140
Causeway Coast and Glens	20	1	5	3	2	3	1	0	0	1	36	0	61	133
Ards and North Down	20	3	11	6	2	3	3	0	0	0	0	0	28	76
Antrim and Newtownabbey	20	5	3	1	2	7	2	0	1	2	2	1	28	74
Mid and East Antrim	17	3	10	4	0	2	2	0	0	0	5	1	26	70
Total	583	99	210	117	56	959	96	63	72	394	1,133	717	1,571	6,070

Source: NISRA, Census 2011- Table CT0354NI: Location Of Usual Residence And Place Of Work In Ireland
Notes: The category "Ireland - Other" includes Ireland - part not specified

NISRA's census based estimates suggest that almost 6,100 residents commute across the border to their place of work in Ireland (see Table 3.3). Flowing in the other direction, CSO (2016) report that over 9,300 people travel to work or study in Northern Ireland (see Table 3.2), of which 7,000 are adults that commute across the border to work. Collectively, the two sets of figures suggest that after discounting students, around 13,000 people regularly commute across the border from their place of residence to their place of work. There are disputes about the robustness of these commuting estimates[12] but it is widely accepted that the Belfast-Dublin corridor and the Derry-Donegal border area form the main focus for cross border commuting.

Concluding remarks

The Northern Ireland downward trend in internal migration, however measured, is consistent with a downward trend across many OECD countries. This international trend relates to the changing composition of the population both in Northern Ireland and abroad. Beyond this, most commentators believe that since the global recession and the resulting housing market downturn, the overall rate of internal migration for Northern Ireland has fallen more sharply than the underlying trend would imply.

Assuming Census and MCR data provides a good representation of population churn, the recent downturn in residential mobility has been accompanied by an increase in the proportions of moves that take place over shorter distances, especially in urban areas of Northern Ireland. Conclusive evidence is lacking, but this is very probably linked to the growth of private renting. The Census shows that when compared to homeowners, private renters are simultaneously more likely to move house, more likely to remain in the same area and less likely to relocate to suburban and rural areas within commuting distance of urban centres. Only time will reveal if recent developments mark a permanent or cyclical downward shift in the scale and geographical spread of residential movements.

Looking at the Derry-Donegal border area, the large majority of cross-border commuters that originate from Donegal travel to the Derry area for work and vice versa. The scale of commuting and its concentration on either side of the border lends support to those who claim the Derry housing market extends across the border into Donegal. In the absence of small area data on the origin and destination of workers that commute across the border it is not possible to explore whether the influence of the Derry housing market extends beyond settlements in very close proximity to the border (e.g. Muff) to places such as Letterkenny or beyond.

Turning to the Belfast-Dublin corridor, the biggest share of cross-border commuters based in Northern Ireland originate in the local authority area of Newry, Mourne, and Down. There is a concentration of commuters to County Louth but significant proportions travel to other areas of Ireland such as Dublin and County Monaghan. For the present, the scale and geographical spread of cross-border commuting flows originating from Newry, Mourne, and Down or from County Louth are not particularly supportive of suggestions that there is a cross border HMA centred on either Newry or Dundalk or a poly-centric HMA encompassing both.

[12] See for instance Shiels and O'Kane (2010) and DCSDC 2017

4. Proposed HMAs

Introduction

This section sets out our proposed functionally defined HMAs and how they compare with the previous HMAs and 2011 based Travel to Work Areas (TTWAs). Both our preliminary and finalised set of functional HMAs were based on an analysis of the MCR data to establish the pattern of origin and destination based flows for adults aged 25+ years plus adults aged 25-64 years. Unless stated otherwise, all reported figures are based on individuals in the 25-64 age group.

Development of prototype HMAs

As with the previous study, the goal was to analyse the origin and destination flows of adult migrants to prepare a set of consistently defined broad HMAs that ensured that each HMA formed a single coherent 'territory'. The process involved applying a set of sequential tests. These are set out in Appendix 2 but can be summarised as follows:

- Step 1: Identify a set of settlement seed points to anchor the analysis and group together wards to create a contiguous urban area for each of these settlements.
- Step 2: Identify the wards that are closely aligned to the housing market of each seeded settlement, starting with wards within the same local authority area. Wards were assigned to a 'preliminary HMA' of a seeded settlement if there was a strong (15%) or substantial (10%) migrant flow from the seedpoint settlement and no significant (5%) flow from any other seedpoint.
- Step 3: If the output from tests carried out in Step 2 proved inconclusive, the analysis was repeated using the 'preliminary' HMAs as the designated seedpoint. These 'preliminary' HMAs involved expanding the original seed point to include wards with a strong and substantial link to the seedpoint. The analysis was also expanded to look at destination flows for the wards (or cluster of wards) being tested.
- Step 4: If the results from Steps 2 and 3 were still inconclusive, the analysis looked in detail at the origins and destinations of movers for each 'un-bounded' area to ascertain which preliminary HMA it had the strongest link to and would thus minimise the number of flows out of each HMA. The 'unbounded' areas typically involved a mix of rural areas, such as Trillick, that have weak residential links to any wider housing market area and larger and more complex overlap areas such as the Banbridge area.
- Step 5: At this stage we mapped the 'prototype' HMAs, tested each HMA for self-containment. We also secured stakeholder feedback on the overall integrity of each 'prototype' HMA and identified what further analysis was warranted.
- Step 6: Building on findings from the stakeholder exercise, further analysis was conducted to finalise the broad HMA boundaries, where appropriate cross checking outputs with Census 2011 migration and commuting evidence.

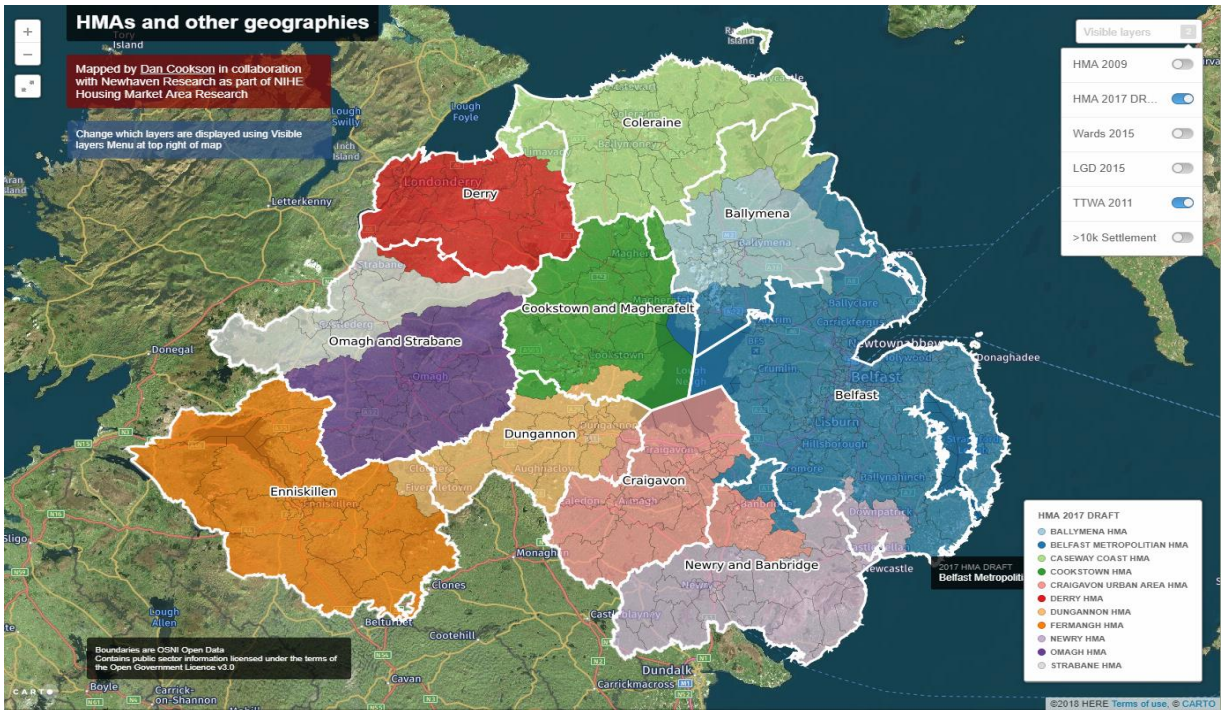
Stakeholder feedback and subsequent refinement of the broad HMAs

Five workshops were held, one with NIHE staff and four with external stakeholders to explore the overall integrity of the 'prototype' HMAs or whether the geographical spread of each HMA looked implausible. We also conducted interviews with estate agents and stakeholders that were unable to attend the workshops. Our preliminary (or prototype) HMAs which were the subject of the stakeholder exercises are shown in Figure 4.1.

The consultation process indicated that the 'big picture' for the different functional HMAs looked convincing. In other words, the prototype 2017 HMA based boundaries were widely considered to provide a recognisable depiction of the functional realities of the housing market across Northern Ireland. We also heard that the overall map of the HMAs appeared, for the most part, to be consistent with important physical features such as the road and rail transport corridors and local topography.

There were, however, differences of opinion about to which broad housing market area Limavady, Banbridge, South Down and Magherafelt should be assigned. Questions were also asked about the area north of Larne. All of these areas were subject to further investigation, the results of which are set out below. During the consultation process it also became apparent that there might be a need to 'tidy-up' the allocation of Dunnamanagh and some other small areas prior to finalising the broad HMAs for the main report. The resulting analysis for these are summarised in Appendix 2 (Annex A).

Figure 4.1: Prototype functional HMAs compared with the 2011 TTWAs



The Limavady area

There were a variety of views about whether the Limavady area formed part of the Derry HMA or the Causeway Coast HMA, with some suggesting that perhaps only the western edge of Limavady should be located within the Derry HMA. As no stakeholder could offer evidence to support any of the competing perspectives, we conducted additional analysis of the MCR dataset as well as 2011

Census flows data. The numbers of MCR records for some parts of Limavady are low and in particular for adults that move to the Limavady area from outside the area (and vice versa). MCR data was therefore aggregated to permit flows to be reported for the former local government areas of Derry, Coleraine and Limavady as well as for Limavady town. We found that:

- Amongst the population aged 25-64 years who chose Limavady LGD as their destination, over 10% came from Derry LGD and 4% came from Coleraine LGD. Likewise, the Census records that of the 1,881 people aged 1+ year that came to Limavady LGD from somewhere in Northern Ireland, 12% came from Derry LGD and 3.5% came from Coleraine LGD.
- Movers from Derry LGD are concentrated in the wards adjacent to the boundary, such as Feeny (16%) but MCR data also shows that the proportions of Limavady Town 'movers' that originated from Derry LGD (5%) also exceeds the rate for Coleraine LGD (3%).
- Magilligan was the only ward in the Limavady area where movers from Coleraine LGD (7%) outstripped those from Derry LGD (4.5%) in the period from 2011 to 2017.
- Labour market linkages between Derry LGD and Limavady LGD are stronger. In 2011 some 30% of all people that worked in Limavady LGD commuted to the area from Derry LGD whilst 16% of all workers that lived in the Limavady area commuted to Derry LGD. The respective Coleraine LGD figures in both instances were around 10%.
- There is no firm evidence that the scale or direction of residential moves has changed since 2011 but MCR data suggests that residential flows between the Derry and Limavady areas may be very gradually increasing.

One important criterion for defining a HMA is to limit the proportion of residential movements that cut through the functional boundaries. Another important consideration is that there should be a reasonable correspondence with the size and shape of the TTWA, reflecting the fact that residential mobility and commuting are interwoven. On balance therefore, we judged that the functional Derry HMA boundary should remain unchanged. This is in line with the views of the majority of external stakeholders who expressed an opinion.

South Down

Stakeholders concurred that the Belfast Metropolitan HMA extended southwards of Downpatrick and that the Newry, Mourne and Down LA was sharply divided between the Belfast Metropolitan HMA and the Newry HMA. Stakeholders generally believed that functional economic linkages between the Downpatrick area and Newry area were limited, with some pointing out that it took longer to commute by car between the two towns than it did to go from either town to Belfast. Stakeholders also suggested that the A24 was an important commuter corridor that extended from Carrydufff to Drumaness and then on to the coastal settlement of Newcastle. As a result, many suggested that we look again at the Drumaness - Newcastle area. The area of interest comprised of 7 wards. Re-analysis of origin based and destination based flows for these wards confirmed that:

- Tollymore, Castlewellan and Ballyward have some connection to both the Belfast Metropolitan HMA and the Newry HMA. However, both singularly and collectively, the three wards experience a higher number of flows to and from the Newry HMA. Interestingly, these flows point to a network of links with rural areas and villages in the Newry area as opposed to any significant link with the town of Newry itself.

- The other 4 wards, including, Donard and Murlough, all experience a higher number of flows to and from the Belfast HMA than to and from the Newry HMA, even when individuals that originated somewhere from within the former Down LGD were discounted from the analysis. These four wards where therefore re-allocated to the Belfast Metropolitan HMA.

Census migration flow counts were too low to draw any meaningful inferences but Census commuting flows data was broadly consistent with the MCR results, although again the numbers of people involved in commuting in this area is not large.

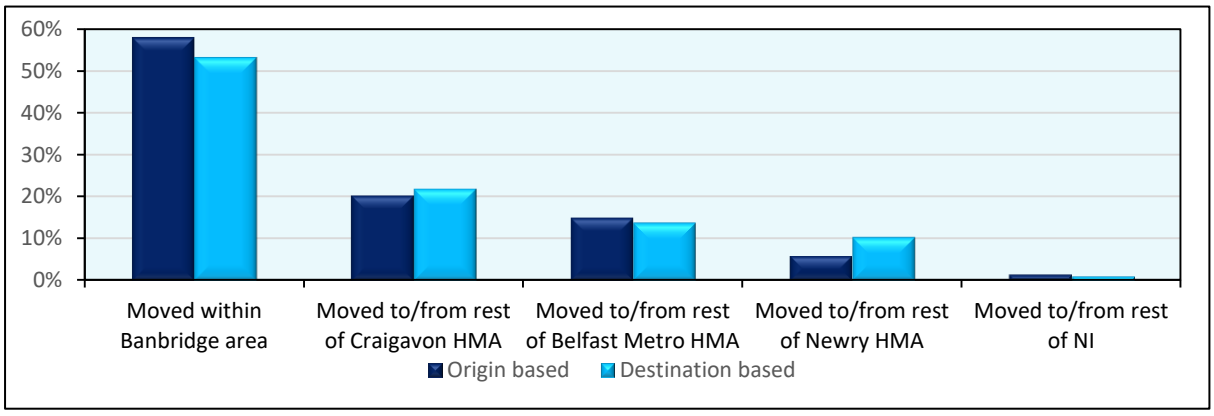
Craigavon-Banbridge area

The previous study found it difficult to assign the Banbridge area to a HMA because it was strategically located at the point where three separate housing markets overlapped – the Belfast Metropolitan HMA, the Craigavon HMA and, to a lesser extent, the Newry HMA. Stakeholder feedback confirmed that there are still diverse views about which HMA the Banbridge area, including the settlement of Dromore, should be located. There were also queries about the geographical coverage of the Belfast Metropolitan HMA in the area along the M1 road.

The area in the vicinity of the A3 and M1 roads from Lisburn to Lurgan and Craigavon is comprised of the wards of Aghagallon, Magheralin, Waringstown and Donaghcloney. Our re-appraisal of the MCR data re-affirms that all four wards are subject to significant flows from the Belfast Metropolitan HMA but flows from the Craigavon Urban Area (CAU) settlement are far larger. In the case of Waringstown, for example, 23% of all movers originated in the CUA and 12% originated from the prototype Belfast Metropolitan HMA. Likewise, 33% of people that moved to or within Aghagallon came from the CUA compared to 17% from the prototype Belfast Metropolitan HMA. The four wards were therefore retained within the Craigavon HMA.

Dromore is known to be connected to Banbridge Town in terms of shopping flows and other activities but this does not translate into residential flows. MCR data indicates that only 2% of people that moved within or came to Dromore came from Banbridge Town. Likewise, of all the movers that originated from Dromore just 4% moved to Banbridge. In contrast, 18% moved to the Lisburn area and over 30% moved to Greater Belfast. Census evidence also indicated that workers living in the Dromore and Gransha area generally commuted to the Belfast and Lisburn areas as opposed to Banbridge or Craigavon. It was therefore concluded that it was appropriate to retain Dromore within Belfast Metropolitan HMA together with Gransha.

Figure 4.2: Origin and destination-based flows in Banbridge Area, adults 25-64, 2011-2017



Source: MCR data, Newhaven calculations (note re-run to check figures precise)

Turning to Banbridge Town and the surrounding wards of Gilford, Quilly and Loughbrickland, further analysis re-affirmed that the most substantial housing market links are with the Craigavon HMA. Figure 4.2 shows that local residents account for over half of all local moves, whether measured on a destination or origin basis but thereafter the Craigavon HMA is the most important 'location', accounting for over a fifth of origin and destination flows.

Although the Banbridge area generally falls within the Newry and Banbridge TTWA, our analysis does not support the re-allocation of the Banbridge area to the Newry HMA. Relatively few residential movements that start in the Banbridge area actually end in the Newry HMA and vice versa. Census commuting flows also indicate that after Banbridge town (5,580 jobs) the former Craigavon LGD (1.026 jobs) and not Newry (756 jobs) is the most important place of work for residents from the Banbridge area. We were initially surprised by the finding as Newry and Banbridge form a single TTWA. However, it seems that a decline in commuters originating from Newry has necessitated this merger. This in turn may well be linked to the growth in the numbers of Newry residents that cross the border to work in Ireland and are therefore excluded from the figures used to produce the TTWAs.

Magherafelt

Magherafelt is a small town that is strategically located close to the A6 road which runs from Belfast to Derry via Antrim. Thus, some stakeholders queried whether Magherafelt should be located within the outer shell of the Belfast Metropolitan HMA. Further analysis confirmed that there is a concentration of residential flows in the area bordering the A6 road between the Magherafelt area (Ballymaguigan and Castledawson and Magherafelt town) and the Antrim area (Toome, Randalstown and Antrim town). However, the numbers of cases are low. The MCR data records that just 114 people aged 25-64 years moved across the council boundary from the Antrim area to the Magherafelt area, which was less than 5% of all people aged 25-64 years whose destination was the Magherafelt area. Casting the net wider, less than 7% of recent movers whose destination was the Magherafelt area came from anywhere in the prototype Belfast Metropolitan HMA. Census flows data paints a similar picture in the sense that the vast majority of migration flows to and from Magherafelt area start and end within the Cookstown HMA.

We therefore concluded that it remains appropriate to fall into line with the TTWA geography and continue to assign Magherafelt to the broad Cookstown HMA. The long awaited upgrade to the A6 from Randalstown to Antrim town may bring changes in commuting and residential patterns in this area in the not too distant future. Whilst it would be inappropriate to speculate what impact this might have on the HMA boundary, it is an issue that NIHE could look to liaise with the two local authorities to maintain a watching brief.

Cairncastle, Carnlough and Glenarm (Larne LGD)

There was broad agreement amongst stakeholders that the towns of Carrickfergus and Larne formed part of the Belfast Metropolitan HMA. It was often observed that good road and railway links sustained these functional linkages along the coast from Larne to Newtownabbey and Belfast City. On the other hand, stakeholders were very doubtful that the Belfast Metropolitan HMA extended north of Larne to Cairncastle, Carnlough and Glenarm. This area had been originally assigned to this HMA for the simple reason that the MCR data suggested that the only potential substantive 'origin' based and 'destination' based residential flows were with Larne Town.

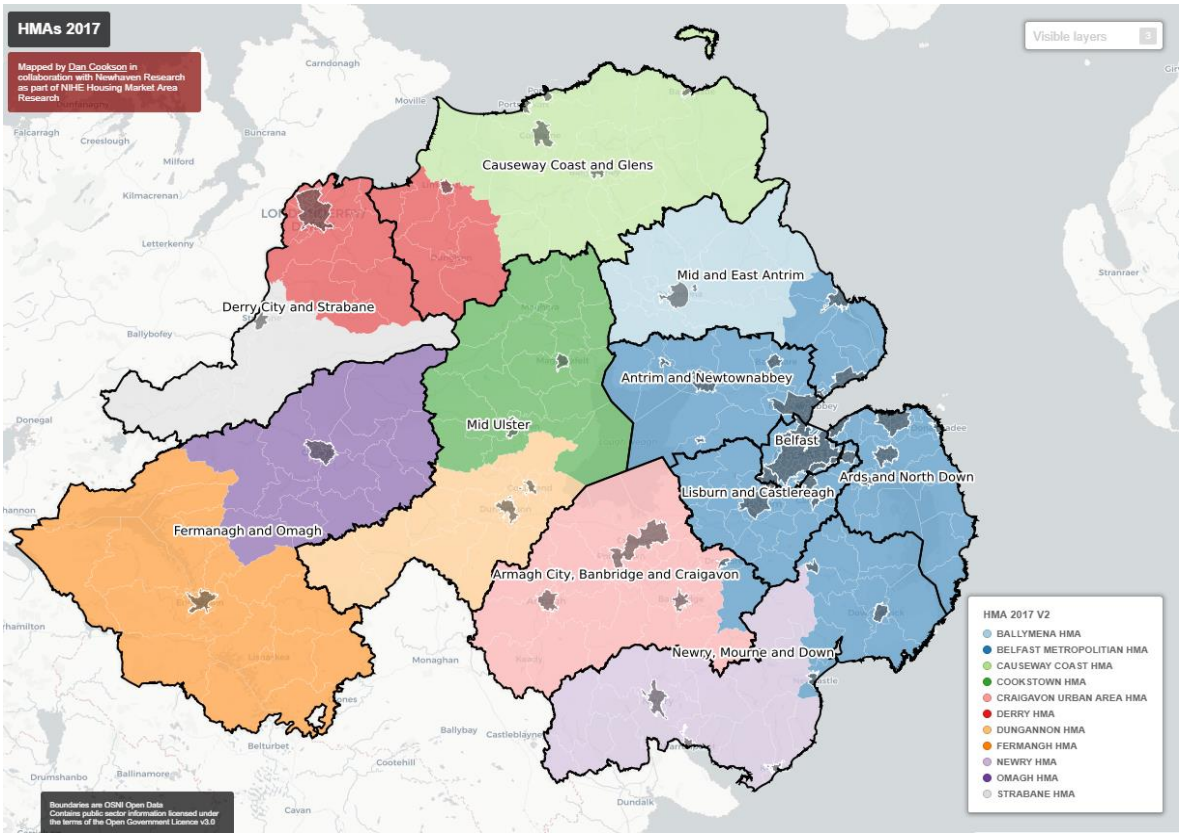
On re-appraising our analysis we revised our 'best fit' definition of Larne town and re-examined flows for each ward to the north of Larne town. This change made little difference to the Cairncastle ward, part of which falls within the town settlement limits and displays substantial links with other wards in the Larne area. It was therefore retained within the Belfast Metropolitan HMA.

On the other hand, the Carnlough and Glenarm ward became 'under-bounded' in the sense there were no origin based or destination based flows to another settlement that attained the 10% threshold. However around 9% of the 843 people that moved to or within this ward did 'originate' from the former Ballymena LGD. The 'destination based' flows presented a similar picture[13]. Evidence from the Census also indicated that the scale of commuting links were somewhat stronger with the Ballymena TTWA than with the Belfast TTWA. As a result, the Carnlough and Glenarm ward was re-assigned to the Ballymena HMA.

The finalised HMAs

Our final set of HMAs, which take account of the analysis carried out in response to stakeholder feedback, are set out in Figure 4.3. The key features of these HMAs are summarised in Table 4.1. For the most part, the spatial extent of each HMA is not a radical departure from those defined in 2009. Most changes are minor and are due largely to methodological adjustments necessitated by the change in ward and council boundaries or improvements in the data availability. The biggest change that has been driven by changes in the strength and direction of residential flows has been the re-allocation of the Banbridge area from the Belfast HMA to the Craigavon HMA.

Figure 4.3: Northern Ireland 2017 based HMAs with LA and settlement boundaries



[13] Thus, Ballymena LGD was the destination of 10% of the 853 movers that originated from Carnlough and Glenarm.

The relative lack of change is reassuring and is in line with academic understanding that broad HMAs gradually evolve rather than change radically in the shorter term. It is also consistent with stakeholder feedback that indicates that geographical linkages across much of Northern Ireland, especially to the west of the Bann, are deep-rooted. The deeply ingrained spatial mental maps that households have may help to explain why we found fewer areas of overlap and fuzzy boundaries than the literature would suggest. From a practical perspective the absence of radical changes to the broad HMA boundaries is also helpful as it allows for greater continuity of analysis over both time and space.

Table 4.1: Summary description of the Housing Market Areas

HMA 2017	Estimated population*		Number of moves	Demand side self containment (%)
	No	Percent		
Ballymena HMA	70,099	3.8	16,546	80.9%
Belfast Metropolitan HMA	917,640	49.3	270,939	94.3%
Causeway Coast HMA	111,534	6.0	25,623	84.3%
Cookstown HMA	83,152	4.5	15,620	82.0%
Craigavon Urban Area HMA	200,494	10.8	47,602	85.3%
Derry HMA	146,533	7.9	37,773	92.5%
Dungannon HMA	63,608	3.4	14,288	81.6%
Fermanagh HMA	63,515	3.4	21,719	91.4%
Newry HMA	117,680	6.3	24,854	85.2%
Omagh HMA	52,284	2.8	10,803	84.1%
Strabane HMA	35,599	1.9	6,978	86.0%
Total	1,862,137	100	545,101	(NA)
Source: MCR (Newhaven calculations) and NISRA population estimates (2016)				

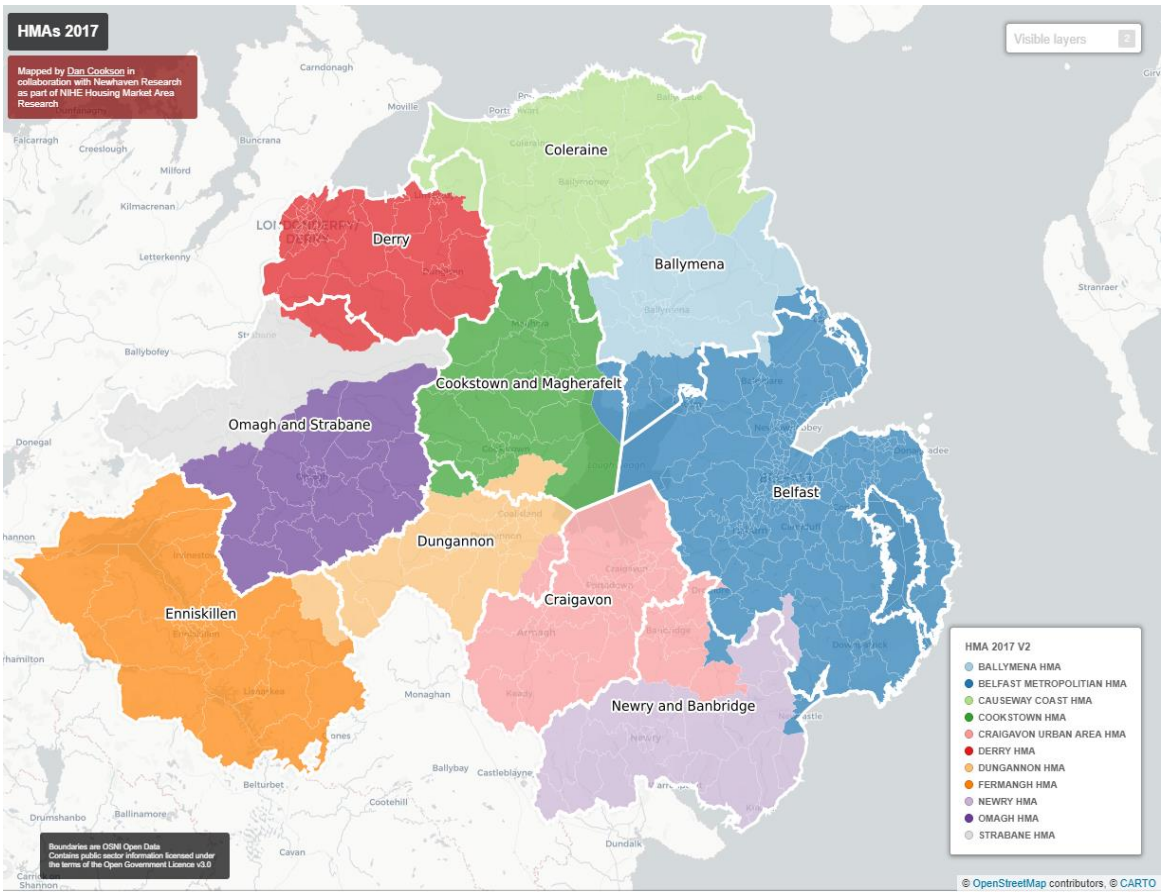
Comparisons with 2009 HMA and 2011 TTWA

For the most part, the geography of the 2017 based HMAs are similar to the 2011 based TTWAs, especially once differences in the spatial building block used to define the HMAs (ward) and TTWA (SOA) are allowed for. There are, however, two important differences. The first, relates to the Banbridge area, which for reasons discussed earlier, has been assigned to the Craigavon HMA as opposed to the Newry HMA. The second relates to Strabane and Omagh.

Although Strabane and Omagh have been merged to form a single TTWA, our analysis confirms that two distinct HMAs continue to function in this area. MCR data indicates that very low numbers of people migrate between the two main settlements[14] or between the two former local government district areas. Commuting flows are also low. According to the Census, in 2011 around 10% of workers that lived in Strabane commuted to Omagh but only 3% of workers that lived in Omagh commuted to Strabane. We suspect a single TTWA has been created because Strabane no longer meets all the required TTWA criteria. There may be several reasons for this but strong possibilities include the decline in the economically active population and the considerable proportions of the local workforce classed as 'working from home' (14%), 'no fixed place' (17%) or 'work outside UK' (3%) and are therefore excluded from the analysis used to define TTWAs.

[14] . MCR data for 2011-2017 shows fewer than 30 people moved from Strabane Town to Omagh Town or vice versa.

Figure 4.4: 2017 HMA boundaries and 2011 based TTWAs compared



Local HMAs within the Belfast Metropolitan HMA

The Belfast Metropolitan HMA is by far the largest and most complex housing market in Northern Ireland. Along with the TTWA geography, the spatial extent of the HMA boundary confirms that the local economy draws in people from a wide area. This extends from the Ards Peninsula and Newcastle in the south to the towns of Antrim and Larne in the North. It is therefore no surprise that the Belfast Metropolitan HMA can be sub-divided into smaller functional areas known as local HMAs, with each one having its own local catchment.

Although the main purpose of this study was to review and update the broad HMAs for Northern Ireland, we voluntarily carried out supplementary analysis to outline the likely spatial extent of the local HMAs that extend across the Belfast Metropolitan HMA. This involved re-working the MCR data to identify and appraise the degree of connectivity between different urban areas, settlements and rural localities within the Belfast Metropolitan HMA. As a guide to this analysis, we used a minimum self-containment rate of 75%. This may seem to be on the high side but it is not too much below the self containment thresholds for the single tier HMAs that operate elsewhere in Northern Ireland. It is also indicative of the fact that MCR dataset does not include movers from outside of Northern Ireland and that MCR outputs cannot differentiate by household representative or by tenure.

Figure 4.5: Belfast Metropolitan HMA – potential Local HMAs

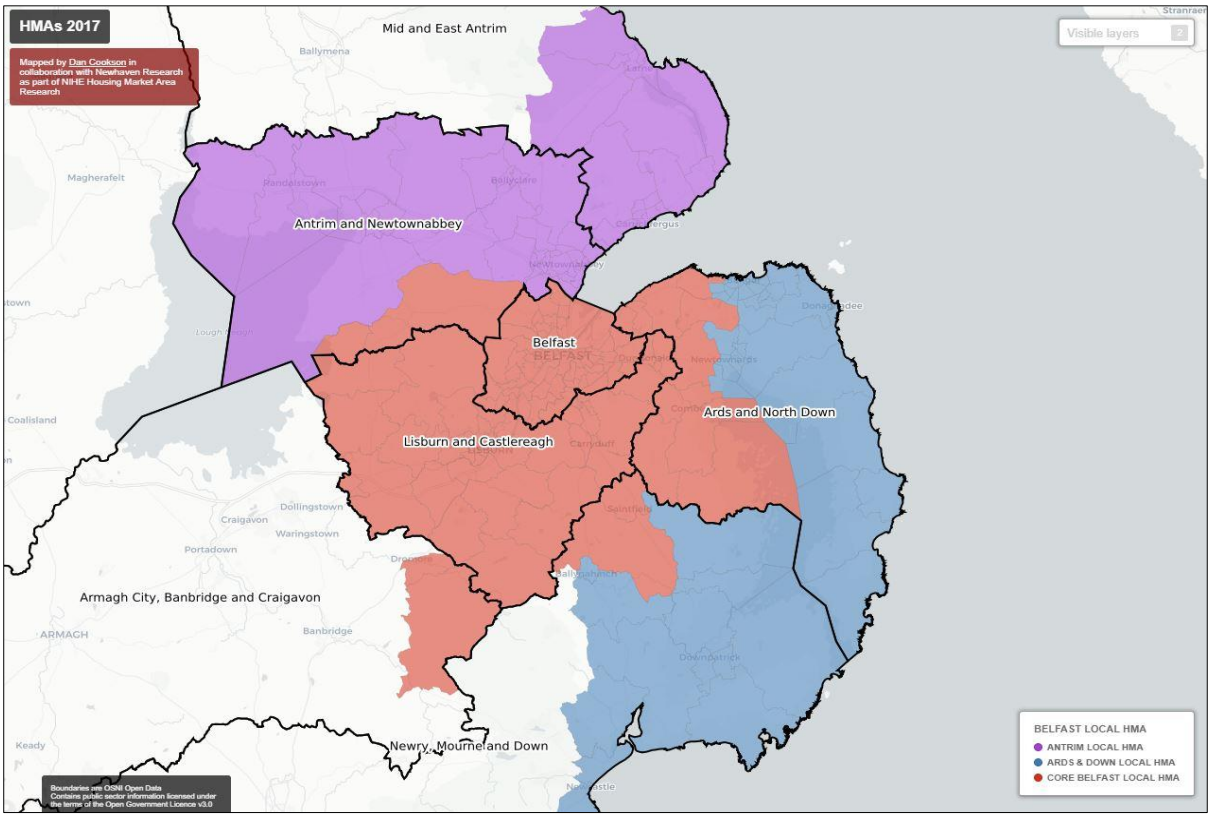
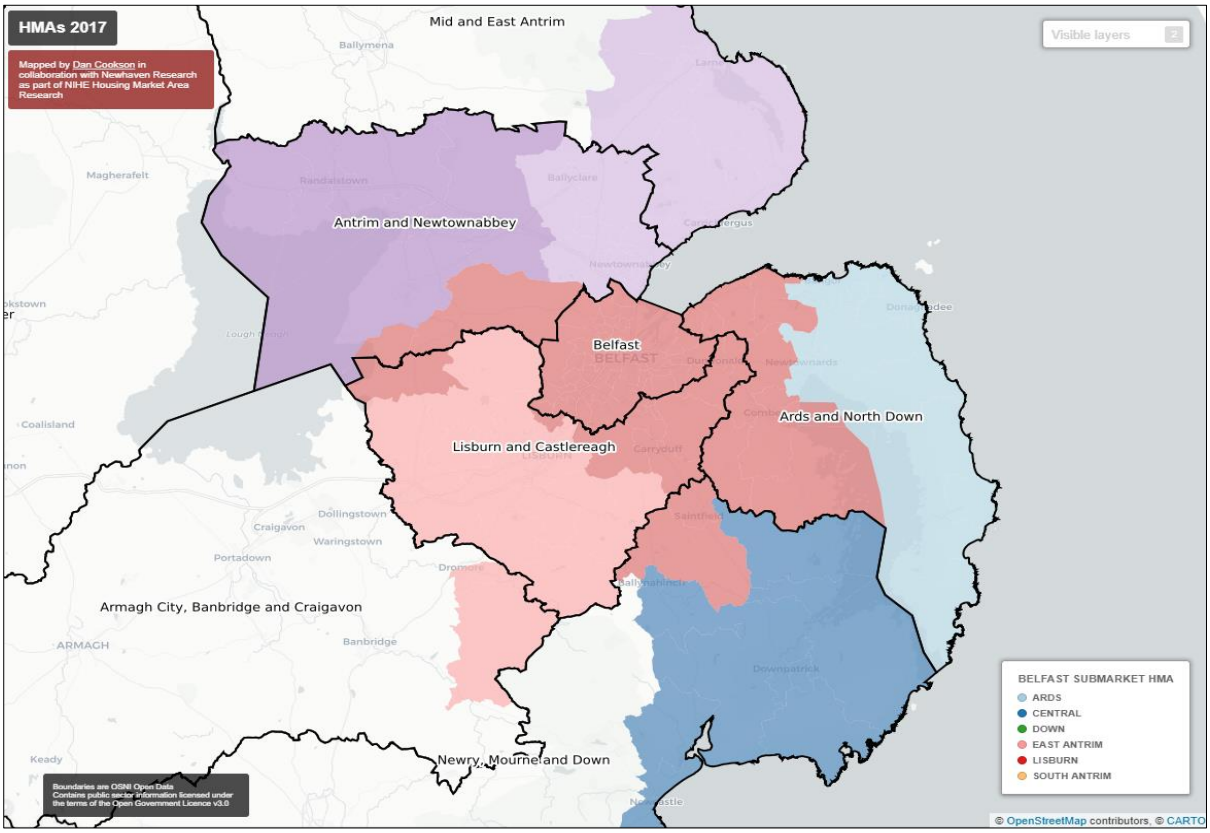


Figure 4.6: Belfast Local HMAs broken down by sub-area



We identified three local HMAs, with each of these further divided into two 2 sub-areas. These results are shown in Figures 4.5 and 4.6. Each of the local HMAs extend across two or more local authorities areas. The boundaries do not, however, correspond with the administrative boundaries of local authorities. On the other hand their geographical shape does reflect the reality that much of the housing demand within the Belfast Metropolitan HMA is generated by households with a strong preference to live in the core, north or south areas of the Belfast Metropolitan HMA. In other words, very few people move from the Local Antrim HMA to the Ards and Down Local HMA or vice versa.

As with any functional boundary, there is a degree of fuzziness about the 3 Local HMA boundaries but they do appear to align with NIHE staff perceptions. As far as we have been able to ascertain, the functional HMA geographies for Northern Ireland as a whole as well as the functional boundaries for the local HMAs that fall within the Belfast Metropolitan HMA also appear to be broadly in line with the views of estate agents.

As part of the stakeholder engagement exercise we interviewed 11 estate agents to gain some impression of their knowledge of housing market search patterns. Whilst hardly conclusive, estate agent feedback pointed to a general acceptance of both the broad HMA boundaries, and in the case of the 3 estate agents that operated in the Belfast Metropolitan HMA, the 3 proposed local HMAs. On saying that, estate agents stressed that they operated over a fairly narrow catchment area, mainly served people that lived locally and that their local clients typically had fairly narrow search patterns in terms of the locations they were willing to consider. This strongly suggests that the views of estate agents are more approximately attuned to defining local HMA sub-markets within a broad HMA rather than the broad HMA itself. This conclusion echoes the findings from the study to define HMAs for England (see Jones et al, 2010).

The six sub-areas are effectively an update of the seven sub-areas that formed the spatial framework that underpinned the Belfast Metropolitan LHSA (O'Sullivan et al, 2011). These areas again do not correspond with administrative boundaries; rather they highlight the extent to which the majority of households move short distances and that these distances are often considerably less than the area over which each of the three local HMAs function.

Table 4.2: Summary description for the Local HMAs

HMA 2017 (first cut)	Estimated population*		Number of moves	Demand side self containment (%)
	No	Percent		
Antrim Local HMA				
East Antrim	152,341	16.6	34,297	78.5
South Antrim	45,874	5.0	9,583	70.9
All Antrim Local HMA	198,215	21.6	45,631	79.8
Ards and Down Local HMA				
Ards	118,112	12.9	27,306	78.2
Down	55,639	6.1	11,895	73.6
All Ards and Down Local HMA	173,821	20.0	39,653	77.6
Core Belfast Local HMA				
Central	437,912	47.7	128,459	84.6
Lisburn	107,692	11.7	17,444	64.5
All Core Belfast Local HMA	545,604	59.4	154,418	86.3
Total	917,640	100	270,939	94.3
Source: MCR (Newhaven calculations) and NISRA population estimates (2016)				

The question of best fit with local government boundaries

Different policy and guidance documents [15] have cautioned that functional geographies such as HMAs should not be constrained by administrative boundaries but have also conceded the need for some pragmatism. English Local Authority Partnerships have tended to adopt a "best fit" housing market approximation to local authority areas, primarily in recognition that most planning and housing policy is made at local authority level. Elsewhere, decisions have been made to constrain HMA boundaries by aligning them with local authority boundaries to overcome the lack of data available at below local authority level. The England wide HMA study also included a final step that entailed snapping the tier 1 HMA to whole local authority boundaries but explicitly stated this was to support modelling rather than local systems analysis.

There is therefore no single right solution in terms of whether or not to define a set of "best fit" HMAs. Ultimately this is a policy matter rather than a research or technical matter. In recognition of this, stakeholders' views were sought about the potential to construct a 'best fit' HMA that would be aligned to local authority boundaries whilst still providing a reasonable approximation of the functional housing markets.

Overall, the findings from both the stakeholder workshops and the programme of interviews with those unable to attend to workshops were inconclusive. Local authority and housing association representatives tended to be hesitant to offer views on whether the principle of a 'best fit' approximation to local authority boundaries was appropriate. Most local authority planners would also not be drawn on what approximations they felt would be appropriate. Where they did express a view, it was usually in favour of aligning the HMA boundary to the local authority boundary for reasons of administrative and political convenience. In contrast, researchers and senior policy stakeholders were generally very wary of any suggestion of creating 'best fit' approximations. This remained the case even when the option of maintaining both a 'gold level' functional HMA and 'silver level' best fit HMA was suggested.

Further consideration of the vexed question of alignment with local authority boundaries

There are practical and resource issues around the production of statistical information on different topics at the broad and local HMA level. However, we do not believe such matters should be the primary consideration in weighing up the merits or otherwise of creating 'best fit' HMAs. Instead, the prime consideration should be the intended use of the HMAs to frame analysis and strategy co-ordination. If the goals are to:

- Guide the NIHE, local authorities and other key stakeholders to think more robustly about the functioning of the housing system across all tenures in spatial terms then, we see no value in creating 'best fit' approximations of HMAs based on local authority geographies.
- Inform decisions on the spatial distribution of new social and affordable housing and/or the spatial local development plans of local authorities, it may be valid to adopt a 'best fit' approach but it would remain important to ensure that notable functional interactions across neighbouring local authorities were made explicit.

[15] See for example DCLG (2007) Identifying sub-regional housing market areas ; Planning Advisory Service (2015) technical advice note on Objectively Assessed Need (OAN) & Housing Targets

In any case, the spatial misalignment of administrative boundaries and functional housing market processes should not be regarded as an irreconcilable problem:

- The majority of the revised HMA boundaries are very closely aligned to the former district council areas and this is a geography that NISRA continue to use to publish data. This was not the case for most of the previous set of HMA boundaries. The revised method has meant that 'under-bounded' rural areas have been assigned according to the 'seeded' settlement (or prototype HMA) to which they have the strongest links. In contrast, such areas were assigned according to TTWA in the 2009 exercise.
- The Craigavon HMA is more or less comparable to the local authority area. The main difference is Dromore. It is for the NIHE to judge whether the appropriate solution would be to modify the Craigavon HMA boundary to include this small area.
- The Belfast Metropolitan HMA extends into Mid and East Antrim, but this area is more or less comprised of the former local government districts of Carrickfergus and Larne.
- Newry, Mourne and Down is split across two HMAs, but most of the former Down LGD falls within the Belfast Metropolitan HMA.

Table 4.3: Pragmatic 'best fit' HMA where small area data is not available

Housing market area	Best Fit local authority	Best fit former LGD
Ballymena HMA	Mid and East Antrim	Ballymena
Belfast Metropolitan HMA	Antrim and Newtownabbey Ards and North Down Belfast City Lisburn and Castlereagh	Antrim Ards Belfast Carrickfergus Castlereagh Down Larne Lisburn Newtownabbey North Down
Causeway Coast HMA	Causeway Coast and Glens	Ballymoney Coleraine Moyle
Cookstown HMA	Mid Ulster	Cookstown Magherafelt
Craigavon Urban Area HMA	Armagh City, Banbridge and Craigavon	Armagh Banbridge Craigavon
Derry HMA	Derry and Strabane	Derry Limavady
Dungannon HMA	Mid Ulster	Dungannon and South Tyrone
Fermanagh HMA	Fermanagh and Omagh	Fermanagh
Newry HMA	Newry, Mourne and Down	Newry and Mourne
Omagh HMA	Fermanagh and Omagh	Omagh
Strabane HMA	Derry and Strabane	Strabane

In line with the requirements of the research brief we have suggested 'best fit' groupings for the purposes of data collation (see Table 4.3). It provides a pragmatic arrangement for the purposes of supporting statistical analysis where data below the former local government district is not available and where it would be hard to produce meaningful outputs by disaggregating local authority data on a pro-rata basis. An example of such data might be economic forecasts. We would stress, however,

that in our opinion these groupings should not replace (or be seen to change) the functional geography of the broad HMAs that have been identified above.

Reporting on LHSA outputs

The NIHE is considering suitable arrangements for reporting the results from future local housing systems analysis. One option that has been suggested is that a single report might be produced covering two or more housing market areas – presumably outside of the Belfast Metropolitan HMA. This is an approach that Scottish Homes adopted when it introduced 'Context Statements'. The suite of context statements provided an overview of demographic, economic and policy trends relevant to the local housing systems and identified issues of common concern across the different housing market areas. That said, the reports were careful to treat each housing market as a separate entity.

Whatever approach to the publication of future LHSA style work is put in place, we would caution against any move to combine two or more HMAs to overcome potential problems of data availability. This would create areas that would be wholly unrepresentative of residential movement patterns, undermining the rationale for defining broad HMAs in the first place.

5. Conclusions

Summary of key findings

Internal migration is a key driver of changes in the spatial distribution of the population across local authority areas and settlements and thus the demand for services. It is also central to the ability of households to achieve their housing related aspirations. Spatial patterns of internal migration in the shape of functional housing market areas therefore have important implications for the planning and allocation of resources to support housing development and to sustain and improve the wellbeing of communities.

This predominately technical report set out to review and update a set of broad HMA boundaries for Northern Ireland. Taking into account the detailed analysis of internal migration using data from the Medical Cards Register (MCR), supplemented with analysis of census flows data and stakeholder dialogue, we have conclude that the following 11 broad housing market areas function across Northern Ireland:

- Belfast Metropolitan HMA
- Ballymena HMA
- Causeway Coast HMA
- Cookstown HMA
- Craigavon Urban Area HMA
- Derry HMA
- Dungannon HMA
- Fermanagh HMA
- Newry HMA
- Omagh HMA
- Strabane HMA

In addition, this report has suggested 3 local HMAs and 6 sub-areas that function within and across the Belfast Metropolitan HMA. These are as follows:

- Antrim Local HMA (made up of the sub areas of East Antrim and South Antrim)
- Ards and Down Local HMA (made up of the sub-areas of Ards and Down)
- Core Belfast Local HMA (made up of Central or Core Belfast area and Lisburn).

The full set of HMA geographies can be accessed here: j.mp/HMA2017_Map

Both the broad HMAs and the local HMAs within the Belfast Metropolitan HMA are primarily intended to provide a consistently defined framework to support the NIHE to develop functionally derived housing market intelligence in order to better understand how the different housing systems that function across Northern Ireland are evolving and adapting to wider economic, social and demographic trends.

It is also hoped that the HMAs will provide a useful tool to anchor strategic partnership working. We believe it is safe to assume that the need for collaboration is greatest in those areas where the housing market connections are most deep rooted and persistent. This equates to those areas where both the 2007 based and the 2017 based HMAs extend across the same two (or more) local authority boundaries.

Interpreting the HMA geographies

In interpreting and using the HMA geography set out in this report we would stress that:

- People move or travel to different places for different reasons and to pursue different economic, social and cultural activities. As a result, there are many different functional geographies and no single set of functional boundaries, such as housing market areas, can satisfy all the monitoring needs of policy makers involved in planning for housing and communities.
- Although the HMAs have been consistently and robustly defined as possible, in reality HMA boundaries do not have hard and fast boundaries. From an analytical perspective this means that undue emphasis should not be placed on being able to precisely match data to the mapped boundary.
- Where local authority areas, such as Mid and East Antrim, straddle two broad HMAs, it will be important to ensure differences in housing demand and local housing-market conditions are kept under review and taken into account in drawing up plans for housing that will be delivered by both social and private housing developers.
- Analysis should pay particular attention to the overlapping area of the Banbridge area. This is an area which has a connection to three HMAs and where changes in local housing market conditions in one HMA may well affect the housing situation in the others.
- Some more sparsely populated rural areas have only a very weak housing links to the wider housing market. Although it was necessary to assign such areas to a HMA in order to produce asset of coterminous boundaries, policies should to take account of the unaligned character of these localities, such as those listed in Table 5.1. These areas are frequently situated some distance from a main road (i.e. an A road).

Table 5.1 Examples of unaligned rural wards

HMA	Weakly aligned wards
Belfast Metropolitan HMA	Ards peninsula south of Carrowdore
Ballymena HMA	Carnlough and Glenarm
Causeway Coast HMA	Coastal villages of the Glens of Antrim
Cookstown HMA	Area to the north of Maghera
Craigavon Urban Area HMA	Areas adjacent to border with Republic of Ireland
Dungannon HMA	Augher, Clogher and Fivemiletown
Fermanagh HMA	Tempo and Brookeborough and around Glendarragh River Valley
Newry HMA	Annalong and Kilkeel
Omagh HMA	Trillick plus Rousky and the Sperrins
Strabane HMA	Glenelly Valley and surrounds

Recommendations

In terms of the future ebbs and flows of the geography of housing market areas, stakeholders suggested that major road upgrades, other infrastructure programmes and major new housing developments could lead to further change, particularly in terms of the 'expansion' of Belfast Metropolitan Area. Set against this are factors that may constrain the geography of housing markets. In particular further cuts in the social security system and local services that make people increasingly reliant on family support networks may further limit the willingness of many individuals and families to move any distance.

Whilst we agree that it is important to keep housing market area boundaries under review, comparisons between the 2007 and 2017 based broad HMAs confirm that changes to the 'outer shell' are gradual. We therefore feel that any watching brief, which should involve both the NIHE and the appropriate local authorities, should focus primarily on:

- The areas most likely to be subject to any spatial expansion of the Belfast Metropolitan HMA and in particular the areas in and around the settlements of Banbridge and Magherafelt.
- The geographies of the local HMAs and sub-areas within the Belfast Metropolitan HMA.

The HMAs defined in this report were based on an analysis of inter-ward flows throughout Northern Ireland. This was the lowest spatial level at which MCR data was made available. Data limitations also continue to hold back attempts to investigate and map any HMAs that might extend across the border into the Republic of Ireland. Looking to the future we would recommend that the NIHE:

- Liaise with BSO to ensure that future work to refine or update functional housing market geographies can make use of data reported at the Super Output Area (SOA) level, consistent with the spatial geography used to define TTWAs.
- Work with NISRA and CSO to explore the scope to develop more robust, anonymised and routinely updated cross-border commuting and migration data. Data that is more easily accessible to researchers and can be reported below local authority level and ideally down to SOA or clusters of SOA areas in cases where this is necessary to adhere to new EU data protection protocols.
- Hold discussions with NISRA and Ulster University about the possibility of using the HMRC data that underpins the NI House Price Index and/or the NI Quarterly House Price Index to map the internal migration patterns of house purchasers that take account of costs and potential burden on solicitors and estate agents respectively.

The NIHE is seeking to use the HMA geographies as a platform to refresh and improve its analysis of local housing systems but it faces challenges in terms of both data availability and the resources required to perform the task effectively. In our opinion the solution lies not in snapping HMA boundaries. Instead we believe the solution lies in viewing local housing systems as an ongoing process rather than the production of a document every few years. We would therefore suggest that the NIHE should engage with local authority planners to:

- Clarify the most critical issues the housing systems analysis should address in the coming year and which will be practical to deliver in light of data availability, especially in terms of key inputs such as the number and composition of households, housing stock composition and changes to the housing stock, incomes, house prices and rents.

- Use LHSA guidance to identify and prioritise key gaps in the evidence base.
- Work in collaboration with NISRA, the Department of Communities, Cache and data providers to agree a plan of action to address the most critical data gaps, especially at local level.

Our experience suggests that some important local level data gaps include the provision of regularly updated data on private and housing association rents, the characteristics and financial circumstances of households in different tenures, lettings to homeless applicants and the location of co-ownership purchases. Feedback from the workshops also suggests there are issues around effective land supply and ownership.

Finally, it would be advisable for the NIHE to conduct further discussions with local authorities and stakeholders about the planned use of HMA boundaries and, more especially, about the potential delineation of local HMAs and sub-areas for the Belfast Metropolitan HMA.

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Appendix 1: Review of the main methods for defining HMAs

Introduction

This appendix reviews each of the three main approaches to establishing the spatial extent of HMAs and their main strengths and limitations.

Use of TTWAs as a proxy substitute for HMAs

Overview of TTWA delineation

The 228 TTWAs, including the 10 TTWAs that extend across Northern Ireland, were produced by ONS and Newcastle University using 2011 Census commuting flow data on the origin (place of residence) and destination (workplace) of adults aged 16+ years that work within the UK (Coombes and ONS, 2015)[16]. Over the last 40 years there has been a trend towards fewer and larger TTWAs, although the pace of decline has slowed since 2001. Between 1981 and 2011 the numbers of TTWAs fell from 344 to 228 and most TTWAs became less self-contained, as commuting distances lengthened, with fewer people commuting less than 5 km and more people commuting 10 km or more to work.

A multi-stage aggregation algorithm is used to group together small areas (i.e. the 890 SOAs in Northern Ireland) into TTWAs, supplemented with discussions with officials from Westminster and the devolved administration to resolve anomalies. The Newcastle University algorithm is designed to identify as many as possible separate areas that meet stated 'closure' criteria:

- Each TTWA must be a contiguous and non-over-lapping area.
- Each SOA can be allocated to only one area.
- Each TTWA must have a minimum of 3,500 workers and achieve a minimum self-containment threshold of 75%, although for areas of between 3,500 and 25,000+ workers, the minimum closure rate progressively decreases from 75% to 67%.

The analysis excludes individuals that work outside the UK, including the Republic of Ireland. The ONS estimate this 'overseas population' is around 53,000 (0.2%). The analysis discounts almost a quarter of workers who were assumed to have the same home and work address. This includes people who mainly worked at (or from) home, work on offshore installations and those with no fixed workplace.

Strengths and limitations

Young and colleagues (2010) found that, for the most part, the spatial extent of TTWAs and HMAs were similar but their findings also cast strong doubt on the use of TTWAs as a direct substitute for HMAs. In particular, they found that between 2001 and 2007 the Belfast Metropolitan HMA had grown to extend over a larger spatial area than the Belfast TTWA. The England wide HMA study also observed that some of the 2001 TTWAs were more tightly defined than broad HMAs, which the study team termed either tier 1 or framework HMAs (Jones, et al, 2010; Jones et al, 2012). They found that this was largely due to the gradual lowering of TTWA 'closure' to prevent localised labour

[16] Alternative 'illustrative' TTWAs for different sub-groups (e.g. workers aged 25-34 years) have been developed for Britain but not Northern Ireland.

markets from being 'swamped' by large TTWAs such as London. To deal with this, a commuting 'closure' rate of 77.5% was used to define their preferred tier 1 HMAs (Jones et al, 2010).

There are four further factors that limit the potential use of TTWAs as the sole basis for approximating HMAs in Northern Ireland. First, in an ideal world, broad HMAs would be based on the spatial flows of households not individuals. This infers that the definition of broad HMAs derived from commuting data should be based on the commuting flows of household representatives (e.g. the highest earner). In contrast, TTWAs are derived from the commuting patterns of all adults aged 16 years or above, including second earners who may commute shorter distances. Second, the inclusion of students in employment in the 'commuting population' increases the probability that TTWAs may under-estimate the geography of functional market of economic centres with sizeable student populations. Third, the TTWA method is rigorous and repeatable but it is also very computationally intensive. This can make it difficult to explain to stakeholders why a given area has been assigned to one TTWA as opposed to another. Finally, UK boundary constraints mean that TTWAs cannot extend across the political border between the North and South of Ireland.

More generally, it is doubtful that commuting flows could be used in isolation to define HMAs. As Hincks and Baker (2013) have observed:

> *"....commuting patterns are unable to capture the idiosyncratic nature of housing market functioning owing to the interaction of supply and demand regimes for housing and are unable to capture constraints placed on arbitrage in the housing market by migration patterns".(p 883)*

Residential flows - self containment approach

Calculating self-containment

Origin based self containment involves establishing the number of households (or individuals) that moved to a dwelling in a given area that previously lived within it (i.e. originated there) as a proportion of all households who selected that area as their destination. If, for instance, 600 out of the 1,200 households that moved to a home in Belfast had previously lived in Belfast, the origin based 'self containment' rate would be 50%.

Destination based self containment involves establishing the total number of households (or individuals) that originated within an area and the proportion that remained in the area as opposed to moving further afield. For example, if 1,000 households in Belfast moved house, of which 600 moved to another home in Belfast and the remaining 400 moved somewhere else, the destination based 'self containment' rate would be 60%.

This approach assumes that a functional HMA exists where the origins and destinations of most households that move home are contained within a specified boundary. It is the most commonly used approach in Britain, largely because its basic principles are easy to understand and the required data is usually accessible.

Closure rates can be measured in two ways; origin based and destination based self-containment (see box). Origin based self-containment rates are more popular for the simple fact that data on the destination of households that leave a region or country is often lacking.

In Scotland closure rates are usually derived from the Register of Sasines data on the origin and destination of house buyers. In England studies tend to rely on Census commuting and/or migration data. Where Census migration is used, closure rates are most commonly calculated for all adult movers. Analysis based on the migration flows of household representatives is rare, mainly because it requires ONS to be commissioned to produce specially requested data.

Strengths and limitations

The England-wide HMA study employed a modified version of the TTWA algorithm to analyse 2001 Census commuting flows to define framework (tier 1) HMAs and 2001 Census migration flows of household representatives to define local (or tier 2) HMAs. The algorithm does not impose a structure on the analysis by starting with seed points; instead it groups wards (and clusters of wards) in whatever way minimises the number of flows that cross them.

Other studies have analysed residential flows to and from a given seed point, such as a town, thereby effectively adopting aspects of the centre to periphery approach.

Whether these different starting points make a significant difference to the end outputs in terms of the boundaries of a broad HMA is a moot point. The England wide HMA study ran different variants of its self-containment method (i.e. avoiding the use of seed points) but none of the alternative upper tier HMA boundaries cut through a built up urban area (Coombes and Wymer, 2010). This suggests that applied with care, seed point based self-containment (and by inference centre to periphery flow) approaches can produce credible HMA boundaries.

Results from self-containment analysis are sensitive to the rules applied, which is also true in respect of centre-periphery flows:

- DCLG guidance has suggested a threshold of 70% but different studies have employed minimum closure rates ranging from 55% to upwards of 80%. One reason for this wide variation is that self-containment rates vary depending on both the data source and the denominator used. Origin based self-containment rates partly depend on whether the overall count includes people that originated in the region, country or abroad whilst destination based closure rates depend on whether the denominator includes people that moved to another UK region or abroad.
- The selection of an inappropriate spatial building block can generate areas that may not be economically meaningful. In the 1990s the council areas of Stirling and Clackmannanshire were each defined as a separate HMA simply because local planners only tested for self containment at the local authority area. Subsequent analysis, however, established there were considerable rates of home buyers between Stirling City and various settlements in Clackmannanshire.
- Although rarely made explicit, it is necessary to set a minimum number of observations to ensure internal coherence and to prevent neighbourhoods and smaller settlements that display high degrees of self-containment from being treated as a standalone HMA. Official guidance is silent on this matter but, based on our review of various studies, it seems that a minimum population threshold of anywhere from 10,000 to 25,000+ has been used.

Centre to periphery flows approach

This approach defines broad HMAs by assessing the strength of mobility between 'seeded' centres and neighbouring settlements and rural areas in order to understand the area of influence each centre projects. The rationale for this approach is that employment and service centres (or hubs) provide access to employment and services, which are important factors in the location choices made by households. A modified version of this approach played an important role in the production of the 2009 based HMAs for Northern Ireland.

Strengths and limitations

The main strength of this approach is that it provides useful insights into where the centre-periphery linkages are stronger or weaker in different parts of an HMA and can shed light on unbounded areas (e.g. settlements that are weakly linked to the core centre).

The method may be less applicable for defining HMAs in 'poly-centric' urban areas such as the North West of England where there are several large cities in very close proximity to each other. On the other hand, as noted earlier, self-containment based broad HMAs rarely, if ever, cut through built up urban areas. This suggests that any risk that does exist is more likely to apply to the process of defining Local HMAs than to broad HMAs.

Like the 'self-containment' approach, this method is sensitive to the rules applied, including the thresholds employed. Various thresholds can be used but they typically range from 5% to 20%, with 10% being the most common.

Another potential limitation is that analysis is often limited to only looking at flows from the centre to the periphery. However, our experience confirms that a 360 degree view of flows is often required to allocate settlements and rural areas that lie some distance away from any major 'seeded' settlement. In short, it is sometimes necessary to look at where people that originate from more remote settlements and rural areas move to.

Appendix 2: Statement of method

Introduction

As noted in the main report, an analysis of internal migration patterns and/or commuting patterns is the most pertinent method for identifying broad housing market areas (HMAs). Our data audit confirmed that the Medical Card Registrations (MCR) data is the single, most timely and comprehensive data source of internal migration. Thus, whilst the previous study used the 2001 based TTWA as the starting-point for defining HMAs, this study primarily relied on an analysis of MCR derived residential movement patterns, with the 2011 TTWAs plus analysis of Census migration and commuting flows used to 'triangulate' outputs from the MCR analysis. The following paragraphs therefore detail the steps taken to analyse the MCR data in order to establish a set of consistently defined HMAs for Northern Ireland.

Medical Card Registrations; the anonymised dataset

Health service registers across the 4 UK countries provide the most comprehensive administrative list of the population (ONS, 2012). Data from these registers are therefore used to inform population estimates and internal migration estimates. The register, which is known as the Medical Card Register (MCR) in Northern Ireland, has near universal coverage (O'Reilly et al, 2012). The Health and Social Care Business Services Organisation (BSO) therefore gave generously of their time to prepare and supply an anonymised MCR sample dataset to enable us to explore patterns of residential mobility and to establish the spatial extent of housing market areas (HMAs) across Northern Ireland.

Table A2.1: Summary of Medical Card Register Data Used for Analysis

LA area (current location)	total records	final sample*	Percent valid
Antrim and Newtownabbey	74,471	73,947	99.3
Armagh City, Banbridge and Craigavon	89,022	88,508	99.4
Ards and North Down	110,181	109,439	99.3
Belfast	222,982	221,211	99.2
Causeway Coast and Glens	75,122	74,569	99.3
Derry City and Strabane	78,619	77,774	98.9
Fermanagh and Omagh	76,585	68,650	89.6
Lisburn and Castlereagh	73,327	72,823	99.3
Mid and East Antrim	76,757	76,354	99.5
Mid Ulster	67,991	67,115	98.7
Newry, Mourne and Down	90,597	89,866	99.2
Northern Ireland	1,035,654	1,020,256	98.5
Notes: Figures based on current location, which equates to destination ward *Records after excluded once records missing ward data, likely duplicates and other exclusions allowed for			

The MCR data supplied by BSO contained 1,035,654 records for people that registered or re-registered with a GP or Community Health Centre as a result of a change of address between January 2011 and the start of October 2017. To preserve anonymity and confidentiality the dataset contained only the following variables:

- Gender
- Date of GP re-registration as a result of a change of address (month and year).
- Age band (0-15; 16-24; 25-34, 35-54; 55-64 and 65+) which refers to the age of the person at the point of re-registration as opposed to their present age. Although the data is coded as

"age at move", strictly speaking the age at re-registration may differ from age a person changed address. For instance a person may be aged 18 at the point they moved home but may be aged 19 when they register with a new GP some months later.

- Ward for previous location and current location, which are based on the 2014 NISRA wards. This means that moves at lower geographical levels cannot be identified. This includes the Super Output Area that was used to prepare the 2011 TTWAs.

On inspection, 15,398 records were found to be invalid, which is equivalent to 1.5% of all records. The vast majority of these cases lacked a ward identifier for a person's previous and/or current location. Table A2.1 shows the impact of this at Northern Ireland and local authority level. It indicates that in 10 local authority areas, less than 2% of records were found to be valid. The comparatively lower rate of valid cases of Fermanagh and Omagh is due to data recording practices and the lack of data on previous address (origin). Some of the discounted records may therefore include people that originated outside of Northern Ireland.

We also identified a small number of potential duplicate records. We were not able to confirm or refute this due to the absence of a unique identifier (e.g. NHS number) or personal data such as name, date of birth and so on. However, BSO carried out an exercise using a sample of cases that we highlighted to them. None of the cases that BSO cross checked against the original dataset was found to be a duplicate. Moreover, the large majority of 'possible' duplicate cases that we identified (whether checked by BSO or not) involved people under the age of 25 years, which were excluded from analysis (see below). No further action was therefore judged necessary.

A somewhat higher number of females are recorded as having moved in the MCR dataset. This gender gap is most pronounced for the 16-34 age group. NISRA report that this reflects the higher propensity of woman to register and utilise GP services than men in this age group, especially young men from disadvantaged backgrounds. In spite of this, we did not find any major differences in the propensities of males and females to move from one local authority area to another.

Some MCR limitations and the age groups used for analysis

The main purpose of our MCR analysis was to aggregate movement patterns of individuals whose move is likely to be shaped primarily by housing related considerations. From this perspective, it is important to be aware that:

- The dataset is essentially a record of individual re-registrations as opposed to individuals. If a person moved on two or more occasions between 2011 and 2017, each move has been recorded separately. In the absence of a person's unique identifier, it is not possible to differentiate between 'single' and 'multiple' movers.
- The data, especially for Autumn, is 'affected' by individuals moving to further/higher education for the first time and thus registering with a new GP. The data also appears to be affected by moves of young adults following graduation.
- The data includes individuals moving to (and from) communal establishments, such as care homes, student halls of residence and prisons. These residential flows are not typically driven primarily by housing motivations and can potentially distort results. In particular, we found that older people moving to communal establishments had a marked effect on flows for some predominately rural wards where the overall numbers of recorded moves tend to be comparatively low.

To allow for some of the above points, the analysis differentiated between moves of all adults aged 25+ years and all adults aged 25-64 years. For the most part, rates for both age groups were very similar, the main differences arising in wards where there were communal establishments. For ease of reference, the figures reported throughout this report are for those aged 25-64 unless stated otherwise.

MCR sequential testing for significant linkages

In brief, the process for identifying the housing market areas involved:

- Identifying the basic spatial building block (in this instance wards) and the settlement seed points to anchor the analysis and then to group together wards to create a contiguous urban area for each of these settlements.
- Using a series of tests in sequential order to identify which wards have a significant flow from (or to) a seedpoint or prototype HMA.
- Conducting 'area specific' analysis to explore areas of overlap, 'unbounded' areas and/or address issues raised by stakeholders via the workshop events or interview programme.

The rest of this appendix is primarily concerned with explaining the detail in respect of the first two bullet points noted above.

Identification of the basic spatial building block

Spatial building blocks need to be as small as data permits. In this instance we used the 2015 based ward. This is now the smallest administrative unit in Northern Ireland and is the lowest spatial level at which BSO reported MCR origin or destination data. In an ideal world we would have preferred the anonymised sample dataset to report origin and destination at small area (SA) or Super Output Area (SOA) in order to ensure a close 'fit' between the aggregated boundary for the HMAs and the TTWAs as well as settlements and other spatial areas of interest. However, a smaller spatial building block, especially the SA, would have posed an unacceptable threat in terms of data protection and confidentiality.

To facilitate analysis, the wards that best matched the settlement limits for all NISRA settlements in band A to G inclusive were identified in the MCR dataset. Similarly, TTWAs and other geographies of interest where defined on a 'best fit' ward basis.

Identification of seed points

Settlements that had the potential to provide a seed point to anchor the analysis were identified. These potential seed points are listed in Table A2.2 and were selected to:

- Reflect the RDS 2035 spatial framework and the main local economic and service hubs identified as part of this framework.
- Include all settlements listed in Band A to D of the 2015 NISRA settlement classification to ensure the initial seed points included settlements with a population of at least 10,000 people, which NISRA indicate are important service provision centres. These settlements also largely correspond to the 'market' towns of the 26 former local government districts.
- Ensure each 2011 based TTWA contained one or more seed points.

Initial testing of flows around the original list of seed points indicated that some of the towns were the centre of important sub-areas but too small in size or gravitational pull to form broad HMAs in their own right. Interestingly, these settlements largely corresponded to those defined in the RDS 2035 as main centres. There were, however, two important exceptions – Dungannon and Strabane. In addition, as discussed in the main report, Banbridge stood out as having a unique spatial function from a housing market perspective.

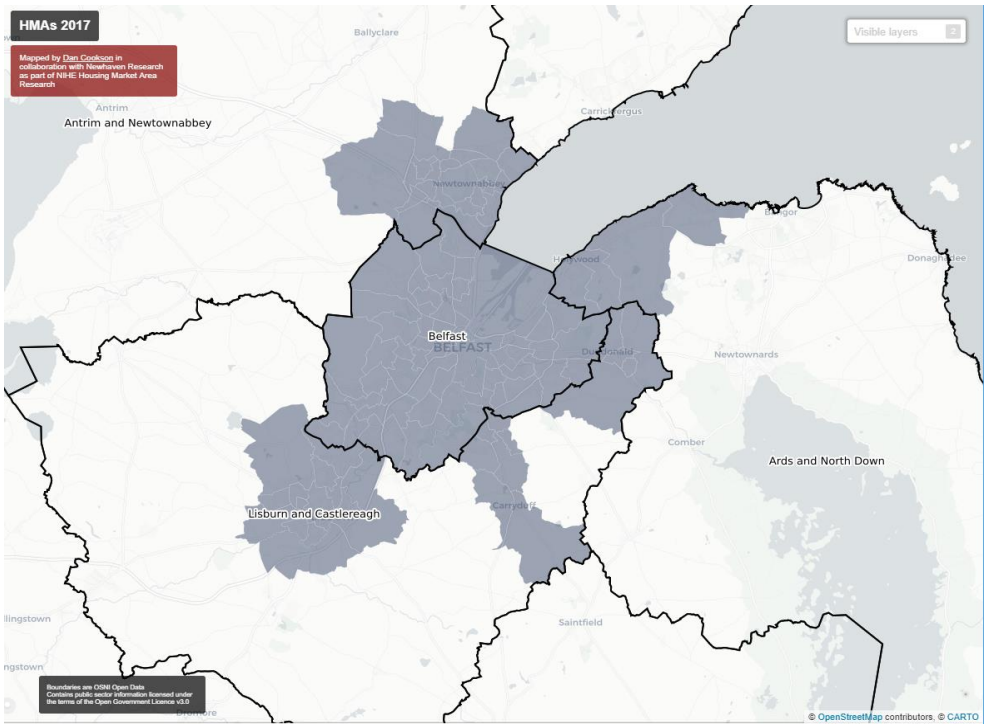
Table A2.2: Settlements tested as potential for use as seed points

Area	Status in RDS 2011	NISRA 2015 Band	Household count 2011	Population count 2011
Belfast	Principle City & sub regional centre	A	120,341	280,211
Derry	Principle City & sub regional centre	B	32,232	83,125
Limavady	Main Centre	D	4,766	12,047
Coleraine	Sub regional centre	C	9,838	24,630
Ballymena	Sub regional centre	C	12,105	29,467
Antrim	Main Centre	C	9,576	23,353
Larne	Main Centre	C	8,152	18,705
Newtownards	Sub regional centre	D	11,533	28,039
Downpatrick	Sub regional centre	D	4,192	10,874
Banbridge	Main Centre	D	6,698	16,653
Craigavon	Sub regional centre	C	25,710	64,193
Armagh	Main Centre	D	5,871	14,749
Newry	Sub regional centre	C	10,136	26,893
Dungannon	Main Centre	D	5,386	14,332
Cookstown	Sub regional centre	D	4,519	11,620
Omagh	Sub regional centre	C	7,956	19,682
Strabane	Main Centre	D	5,113	13,147
Enniskillen	Sub regional centre	D	5,729	13,790
Magherafelt	Main Centre	E	3,245	8,819
Ballymoney	Main Centre	D	4,353	10,393
Ballycastle	Main Centre	E	2,146	5,238
Other band D settlements included in initial seed point testing				
Warrenpoint		E	3,296	8,721
Newcastle		E	3,224	7,743

Greater Belfast

Initial testing using the NISRA definition of Belfast City, which more or less corresponds to the local authority area, proved to be not wholly satisfactory. This stemmed from the fact that the built up urban area of Belfast extends into neighbouring local authority areas. To allow for this, we created a larger seedpoint that we called Greater Belfast. This was designed solely to provide a suitable anchor for analysis and does not necessarily have any other intrinsic value. This refinement is consistent with research literature from England and the findings from the England wide study that broad HMAs do not cut across major urban areas. The area defined as Greater Belfast is shown in figure A2.1.

Figure A2.1: Greater Belfast seed point



Assessment of the strengths of residential flows

Building on the broad approach adopted in the previous study (Young, et al, 2010) and work in Scotland (DTZ, Pieda, 2003), we devised a four-step procedure, which is set out in Table A2.2.

This procedure was designed to begin by assessing the strength of residential flows between the selected seed point settlements and nearby neighbouring settlements and rural areas. The results where then used to determine, where possible, which settlements and rural areas made up the 'catchment area' for each seed point settlement. As discussed elsewhere in the main report, the rationale for this group of sequential tests is that urban centres provide access to employment and services that are the key factors in the location choices made by households.

MCR data was used to tabulate origin and destination flows for adults aged 25+ at ward and settlement level. These outputs were then used to establish the proportions of migrants aged 25+ migrants that moved within or to each ward (or settlement) that were accounted for by people originating from one or more seed point settlements. This process was then repeated for those aged 25-64 years.

The origin-based outputs were appraised against the criteria listed under step 1 in Table A2.2. Wards (or clusters of wards) that were subject to strong or substantial influence from a seeded settlement and had no significant flows from any other seeded settlement were 'allocated' to the provisional HMA for the corresponding seeded settlement.

In terms of wards that could not be assigned we then:

- Conducted another round of analysis (step 2) but this time using the provisional HMA (identified by extending the seeded settlement to include adjoining wards with strong or substantial links to it) as the "seed point" and re-appraising origin-based outputs against the criteria in Table A2.2.

- Calculated and appraised destination-based flows between the ward and the provisional HMA against the criteria in Table A2.2.
- The above process was then repeated with the expanded HMA (step 3) until the large majority of wards could be assigned.

Table A2.2: Sphere of influence criteria

Step	Interpretation	Criteria
Step 1	Subject to strong influence from seeded settlement	At least 15% of all migrants originate from seeded settlement and no significant in low (5%) from another seed point
	Subject to substantial influence from seeded settlement	At least 10% of all migrants originate from seeded settlement and no significant flow (5%) from another seed point
	Allocate ward to HMA or move to step 2	If above origin based tests are positive add ward to provisional HMA for seeded settlement
Step 2	Subject to strong influence of 'provisional' HMA	At least 15% of all migrants originate from provisional HMA and no significant in low (5%) from another provisional HMA OR At least 15% of all migrants from ward move to provisional HMA and no significant outflow (5%) to another provisional HMA
	Subject to substantial influence from 'provisional' HMA	At least 10% of all migrants originate from provisional HMA and no significant in low (5%) from another provisional HMA OR At least 10% of all migrants from ward move to provisional HMA and no significant outflow (5%) to another provisional HMA
	Allocate ward to HMA or move to step 3	If above origin based tests are positive add ward to provisional HMA for seeded settlement
Step 3	Repeat step 2 using expanded provisional HMA and reassign as necessary	
Step 4	Bespoke analysis for remaining un-assigned wards	

This iterative process essentially meant that in the first instance it was not possible to align Larne Town to any HMA. However, once the provisional Belfast Metropolitan HMA had been expanded, it became apparent that in spite of the comparatively low numbers of people moving between Larne Town and Greater Belfast, the only substantial inflows and outflows were to the expanded HMA that included Newtownabbey and Carrickfergus as well as Belfast.

The fourth and final step was to ensure all wards (or cluster of wards) that remained unassigned were subject to bespoke analysis. This analysis mainly involved under-bounded wards (i.e. those with very weak links to any wider HMA) and wards located in areas where two or more HMAs appeared to overlap. The precise analysis varied from ward to ward but essentially:

- In the case of under-bounded wards we examined whether it had links to nearby settlements that were already identified to have links to a specific preliminary HMA. For example, our original decision to assign the Glenarm area to the Belfast Metropolitan HMA was mainly informed by the fact that the Glenarm area has links to Larne town, albeit these links only just attained the significance threshold of 5%.

- For overlap areas we looked at the numbers of flows between the ward (or cluster of wards) and the provisional HMAs - or if there were a number of unaligned wards the TTWA that most closely resembled the HMA - in order to try and allocate each ward to the HMA to which it appeared to be more strongly connected.

In terms of steps 1 to 4 it is also important to note:

- Where the rates varied for 'movers' aged 25+ years and those aged 25-64 years, the latter were used to assign wards.
- In spite of having almost 7 years worth of MCR data, the numbers of both origin-based and destination based cases for some rural wards were very low (fewer than 600 in either direction). NI rural wards also tend to have high 'within ward' moves, such that ward level 'closure rates' can exceed 50%. Where a combination of low case numbers and high closure rates prevented inferences to be drawn, clusters of neighbouring wards were analysed to explore housing market linkages.
- In the case of the Belfast Metropolitan HMA (where boundaries have shrunk back slightly) we examined annual flows to and from wards near the 'outer rim' to see if any trend was apparent but the results proved inconclusive.

Mapping, triangulation and sense checking

The prototype HMAs suggested by the analysis carried through step 1 to 4 were plotted in GIS and a new variable identifying these areas was added to the SPSS version of the MCR dataset used by Newhaven Research to conduct the analysis. Thereafter:

- Closure rates for each proposed HMA were checked to ensure they met or exceeded a minimum self-containment threshold of 77.5%, which is the rate recommended by the findings from the England wide HMA process.
- These prototype boundaries were compared with the 2011 based TTWA in GIS to "sense check" them. This check reassured us that the boundaries were consistent with the theory of housing markets, which suggests there should be a reasonably close alignment between the broad HMA and TTWA boundaries in terms of spatial scale and coverage.

As noted in Section 2, there is no natural level at which to set a self containment. This means that the appropriateness of a threshold can only be judged by the validity of the HMA boundaries that result. We found that applying the 77.5% threshold worked well, such that:

- Reducing the threshold to 70 percent would lead to an increase the numbers of HMAs, with places such as Armagh, Limavady and Larne emerging as separate HMAs. We interpreted this to mean that adopting a lower threshold greatly increased the risk that smaller distinctive local sub-areas within a wider HMA would be mistakenly classed as broad HMAs. It also became apparent that adopting a lower threshold increased problems of fragmentation and made it much more difficult to assign "under-bounded" rural wards.
- Increasing the threshold to 85% could potentially produce 1 or 2 fewer HMAs but this would have a distorting effect on the functional geography of HMAs. In particular it would require some of the predominately rural HMAs to be deconstructed and regrouped in ways that seemed to be out of keeping with the natural grouping of areas. It would also mean areas would fall out of alignment with the TTWAs, which was an important consideration.

Stakeholder engagement on the prototype HMAs

Once the prototype HMA had been prepared, these were subject to testing and further investigation through a series of workshops with external stakeholders plus a programme of interviews with a range of estate agents and other housing professionals to gain a deeper insight into local knowledge and understanding of the spatial extent of functional HMAs and to identify issues that might benefit from further consideration.

Further refinement

The final stage involved revisiting the HMA boundaries to explore issues that emerged from the stakeholder consultation exercise and comparing key outputs against census evidence on commuting and migration flows.

Annex 2.1: Supplementary note on small areas raised at workshop events

Fivemiletown (Mid-Ulster)

Fivemiletown is home to some 550 households. The ward of the same name extends across the surrounding rural area and is divided between the Enniskillen TTWA and Dungannon TTWA. MCR data points to highly localised flows between the Fivemiletown ward and the Fermanagh LA wards of Tempo and Brookeborough. However, the numbers involved are low (well under 100 in either direction) and are of a similar order of magnitude of flows between Fivemiletown and the neighbouring Mid Ulster ward of Augher and Clogher. We therefore concluded there was no technical reason or practical value for re-assigning this ward to the Fermanagh HMA.

Valley (Mid- Ulster)

This rural ward is situated in the North Eastern corner of Mid-Ulster LA and is characterised by very few origin based or destination based flows. For instance, the MCR data contains just 600 cases for people aged 25-64 that choose this area as a destination over a period of almost 7 years. In comparison to much of rural Northern Ireland, the valley area is fairly open with significant proportions of people moving to (and from) the area. The MCR data indicates around 10% of 'movers' that originated from this area moved to the wider Ballymena area. Flows in the opposite direction were of similar proportions. However, in numerical terms the numbers of cases are low, with fewer than 100 people moving to or out of the area in the 2011-2017 period. We therefore concluded that there was no practical value in moving ward into Ballymena HMA from the Cookstown HMA.

Dunnamanagh (Strabane)

MCR data indicates that close to 25% of people aged 25-64 that moved to or within this ward came from the Derry City area. The proportion of all movers that originated from this ward and moved to the Derry area was similar. The ward is comprised of two SOA, one of which falls within the Strabane and Omagh TTWA but as we cannot disaggregate the MCR data further we have assigned the whole ward to the Derry HMA.

Rural southern edge of Causeway Coast HMA

The south edge of the Causeway Coast LA is in the Ballymena TTWA but in the Causeway Coast HMA. This rural area is comprised of 4 wards. In the 2011-17 period, fewer than 3,000 people chose one of these 4 wards as a destination, including existing residents. Whilst small in numerical terms, a sizeable proportion of 'movers' to Clough Mills came from Mid and East Antrim (20%), mostly from the Ballymena area. However, looking collectively at the four wards, both the numbers and proportions of people who moved to the area from outside the Causeway Coast LA area were very modest. MCR indicates than over 77% of people aged 25-64 that chose this area as their destination already lived in the local authority area and less than 10% came from Mid and East Antrim. We therefore judged there was no practical benefit of realigning the HMA to match the Ballymena TTWA rather than the LA boundary.

Annalong and Kilkeel

The coastal settlements from Annalong to Kilkeel at the foot of the Mourne Mountains are essentially under-bounded but their location means they have had to be assigned to the Newry HMA which is the nearest seed point. There are more flows to Newry than any other seed point but both numerically and proportionately these flows are very modest.

Appendix 3: Data audit

Summary

The table below summarises the findings from our data audit. It focuses on data that could be used to define the spatial extent of the HMAs or cross-check emerging results. It does not review data sources that could be used to analyse the housing system. Outside of the Census, and the Medical Card Registrations data, we were unable to identify credible and robust sources of 'hard' data that could be used to explore patterns of residential mobility to inform the delineation of HMAs. For the present, national survey sample sizes fall well short of the numbers required to support analysis of local residential flows.

A limitation of the MCR (and for the most part Census data) is that migration flows are based on the movement of individuals whereas housing demand is mainly a function of household numbers, formation rates and residential moves. Ideally it would be useful to look at the residential movement patterns of households, broken down by tenure. However, data to support such analysis at local level is not currently available.

The North and South of Ireland Censuses and the All-Ireland Census Report are valuable sources of information for many topics. However, the published data has shortcomings from the perspective of exploring cross-border flows. Some questions are phrased in different ways in the two Census questionnaires and thus the resulting data is not strictly comparable. More significantly, the matrix tables that report on both place of origin and place of destination of people commuting or moving from North to South or vice versa are not routinely published below county or local authority level. Moreover "place" is often defined as country or county.

The CSO and AIRO have issued census 2016 counts of people who commute from South to North for work or study but the destination (1992 based ward) and origin (ROI electoral division) of commuters are published in separate tables and cannot be linked. Sub-local authority UK Census commuting flow tables accessible through NOMIS or the UK Data Archive do not generally disaggregate "outside UK" by country, thereby precluding analysis of cross-border flows.

There is now much discussion about combining data from big data sources to explore various issues, including the possibility of residential mobility both within and between nation states. It is certainly the case that technological developments have reduced the cost of data storage and made the computing of 'big data' somewhat more accessible but it has not greatly eased the complications of combining data from different sources. Nor has it eased the various challenges endemic to data analysis, including obsolete and missing data. Thus, even assuming private companies might share customer data, the potential to use data collected by the likes of utility companies or financial institutions to map patterns of residential mobility is very unlikely to happen in the near future.

Qualitative evidence supports the existence of cross-border functional economic areas in different parts of Europe but hard data to test and define the spatial extent of cross-border functional areas remains scarce. To date we have not been able to establish any study or project that has successfully mapped cross-border broad or local HMAs.

Table A2.1: Data Audit- Key Data Sources

Source	Description	Comments/Issues
Census		
Census 2011 (NISRA)	Census 2011 – commuting and internal migration data	Most complete origin and destination data of commuters aged 16+ and internal migrants (individuals and wholly moving households) in NI and UK. Tables are based on a 100% sample and tables for higher geographies report on characteristics of 'movers' including tenure of current residence but not previous) tenure. As a snapshot of patterns and only updated every ten years, may not provide wholly representative picture. The Census does not identity people or households that moved 2+ times in the 12 months prior to Census or people who moved away but returned to original address within this 12-month period. Commuting and migration origin-destination 2011 data is issued by ONS, mainly via NOMIS (open access tables for NI down to LGD level) and the UK Data Archive (mix of open access and secure tables at LGD and below). To preserve confidentiality and minimise the risk of disclosure, census records are subject to 'swapping' between areas. This affects NI migration counts at LGD level and below. SCAM (small cell adjustment method) was not applied to 2011 Census data but it had big impact on 2001 migration data for NI. Any 2001 and 2011 comparisons at LGD and below must therefore be treated with much caution.
ROI Census (CS)	ROI 2011 and 2016 Census results on line	The Census is the main source of migration data and includes three key questions - place of birth, nationality; and time spent abroad. Although it asks about address one year ago, this is only used to report on population churn within Ireland. Thus cross-border residential moves are not routinely reported.
POWSCAR: Place of Work, School or College - Census of Anonymised Records (CSO)	2011 and 2016 ROI Census - geo-coded journey to work /study flows, including cross-border crossings.	POWSCAR offers potential to 'map' cross-border LMA and HMA, assuming comparable NI Census matrix made available. However, access to ROI Census micro data file (RMF) that contains socio-economic data on commuters is strictly controlled. Summary 2016 south to north commuting (work/study flows by county. Map of output data in All Ireland Census 2011 report.
House prices		
NI House Price Index (NISRA -LPS)	Latest publication May 2018 (for Q1, 2018)	Based on HMRC stamp duty data from 2005 onwards. Hedonic modelling used to produce a mix-adjusted standardised property price for NI. Some basic LGD figures also published. Does not capture origin address of purchaser or whether purchaser is a first time buyer. Dataset does not appear to yet cover sufficiently long period of robust transaction and property characteristic data to permit sub-market

Source	Description	Comments/Issues
		identification. HMRC will not permit release of data at small area level Ongoing work to improve validation, but quality of NI data prior to 2012 appears to be less certain, especially in terms of address and property characteristics.
Quarterly House Price Index (Ulster University with support from NIHE & Progressive Building Society)	Latest publication May 2018 (for Q1, 2018)	Currently based on some 8,000 to 9,000 open market house sales transactions per annum, which is around a third of all sales. Sourced from a network of estate agents. Publication based on mix-adjusted price index but includes useful commentary and insights from estate agents on changing market conditions. Sample size too small to support detailed neighbourhood price level analysis and modelling required to define sub-markets.
Demographic		
NHS Medical Card Register Health & Social Care Business Services Organisation (BSO)	BSO has issued an anonymised version of dataset, for over a million cases. Data permits analysis of internal migration flows down to 2015 ward level	Main data source used by NISRA to estimate internal migration and international in-migration. Provides near-universal coverage of usual NI residents. Limited number of fields – origin and destination ward; age band; gender and date (month & year) of registration. Subject to some error: • Some very short distance moves may not be recorded where it has not been necessary for individuals to register with a new doctor • Some list inflation due to lags in reporting change of address, especially near border, presumably due to people not reporting outflows to ROI etc. • Some deficiencies due to lower registrations rates for some sub-groups failing to register (e.g. young males). However, errors are nowhere near scale that precludes data being used as main source of information to plot HMA boundaries. Unable to group individuals by household or family and thus only able to analyse individual case flows. Includes people usually excluded from HMA analysis such as students who register with a doctor /community health centre in their study area and older people moving to care homes and other communal provision
Mid-year population estimates (NISRA)	Annual figures for NI, LGA (old and new) 1992 wards and SOA. Latest 2016 (issued June 2017)	Annual figures broken down to SOA and split by age and gender. Tables also report components of change. Migration estimates are subject to some error, linked to limitations of Medical Card Register noted above.
Population	Biennial at NI/LGA	National projections by age and gender are produced every

Source	Description	Comments/Issues
projections (ONS/NISRA)	level. NI level (2016 based) published Oct 2017; LGA due Spring 2018[17]	two years. LGA figures are issued some 6 months later and are constrained to sum to the NI total. Historically NI level figures have provided a more robust guide to the future than LGA level. Brexit has increased uncertainty, especially for the net migration component of the projections.
Household projections (NISRA)	Latest NI and LGA (2012 based) issued March 2015 Next update TBC NISRA working on assumption 2016 based figures will be issued towards end of this year. Updates subject DfI funding/commissioning	Household projections are trend-based and take no account of the potential changes in policy, economic or labour market conditions. The 2012-based projections build on the 2011 Census and should provide reasonable indication of household formation for the period from 2012-2017 for which we have MCR data. The underlying population projections are out of date but differences between the 2012 and 2014 population projections are modest, suggesting a population uplift of less than 0.5% at LGA level.
Births (NISRA)	Registrar General Annual Report – data for 2016 published in November 2017	Statistics on births to women in NI but resident in the ROI can be broken down by Health Trust and on occasion LGA but not lower. The data offers some insights into cross-border flows in terms of the use of healthcare services but access to services is not a feature of the process of defining HMAs.
Economic/labour market		
TTWAs Census 2011 CURDS/ONS)		Labour market areas defined based on commuting patterns. The TTWA uses an algorithm, a feature of which is to limit the 'swamping effect' of commuting to/from London and other large cities on more localised labour markets in the surrounding area. There are some differences between the 2001 TTWA and the 2011 TTWA but most seem to be driven by technical changes, such as shift from ward to SOA as the basic spatial building block. Strabane no longer self-contained TTWA and extent of Belfast TTWA has apparently shrunk back.
Labour Force Survey (DfE/NISRA)	Quarterly survey: NI quarterly outputs plus annual NI/LGA outputs via the Local Area Database 2016 LAD issued July 2017	Achieved sample of circa 2,500 households per quarter. Allowing for sample overlap of 80%, annual sample is circa 5,000. Along with the NI Census of Employment provides some contextual data on labour market structure and economic activity. However, sample size prohibits analysis of internal migration across NI.
Cross-border student flows (DfE/CSO)	Students enrolled at Higher Education Institutions (HEIs) in the UK and ROI by	InterTradeIreland, the cross-border trade and business body, summarise cross-border North-South education statistics for All Ireland.

[17] NISRA have yet to confirm date but verbally indicated could be around end April/ early May

Source	Description	Comments/Issues
	institution and by country of domicile 2016/17 figures for NI published Feb 2018	In the 2011-16 period some 3,000-4,000 students moved from north to south or vice versa each year. OECD has stated that relatively speaking, student cross-border mobility remains low. Students, where possible, are excluded from analysis to delineate HMAs. Students account for a large share of longer distance moves (often involving a move to and from parental home) that can distort analysis.
Socio-demographic		
Northern Ireland Longitudinal Study (NILS-RSU/NISRA)	30 year longitudinal census data for NI (28% sample) plus. linked data from the NI Health Card Registration system	Allows exploration of movement propensities of different ethnic, age, gender, and socio-economic etc groups Sample may be too small to support flows analysis to support HMA delineation, Analysis must typically be carried out within the NILS-RSU /NISRA secure environment.
Northern Ireland Omnibus Survey (NISRA/CSU)	Survey report is not published; rather commissioning bodies publish ad hoc reports on specific topics	Conducted several times each year. Each survey based on circa 1,100 achieved interviews. Core survey collects socio-economic data and 'add on' modules (variable) include client commissioned questions on a variety of topics. Former HMA study included commissioned module but achieved sample of movers was too small to help define functional areas.
Family Resources Survey (DfC/CSU)	Annual publication Not known when NI 2016-17 will be issued due to computer issues and delays in producing 2015-16 outputs.	Detailed survey based on achieved sample of c4,000 people and c1,900 households in NI each year. Not designed to explore residential mobility Sample size too small to provide contextual information on household composition and income below Belfast/urban and rural split.
Continuous Household Survey (NISRA/CSU)	Annual publication – last published March 2017 (for 2015-16)	Achieved sample of c 2,500 households and is too small to support ward level analysis. Previous NI- HMA study included a small 'bolt-on' module to the main survey but the findings could not be reported at HMA level.
NI House Condition Survey (NIHE)	Five yearly survey, figures for 2016 due to be issued shortly	Sample size was identified in previous study to be too small to permit analysis of residential mobility Reduced sample size to for 2016 reinforces that this is not suitable dataset for the purpose of this study.

List of Abbreviations
The Executive Office (EO)
Department of Agriculture, Environment and Rural Affairs (DAERA)
Department for Communities (DfC)
Department of Education (DoE)
Department for the Economy (DfE)
Department of Finance (DoF)
Department of Health (DoH)
Department for Infrastructure (DfI)

Northern Ireland Statistics and Research Agency (NISRA)
Northern Ireland Housing Executive (NIHE)
Office for National Statistics (ONS)
Centre for Urban and Regional Development Studies, Newcastle University (CURDS)

Appendix 4: Stakeholder engagement

Annex 4.1: List of external stakeholders

The following individuals' participated in one of the four external workshops or the interview programme:

- Suzanne Bagnall – Department of Infrastructure
- Neal Blaire - Ulster University
- Chris Boomer - Mid Ulster LA
- Sinead Boyle – Ards & North Down LA
- Julie Brown - Ards, Banbridge and Craigavon LA
- Maire Clarke - Mid & East Antrim LA
- Hilda Clements - Fermanagh & Omagh LA
- John Crabbe - Landlord Association of Northern Ireland
- Ciara Cunningham - Land & Property Services, Department of Finance
- Karen Dickson - Causeway Coast & Glens LA
- Tony Dignan – Researcher, Economic Evaluation
- Richard Elliot - NISRA
- Carol Ervine - Choice Housing HA
- Michael Francey - Mid & East Antrim LA
- Joe Frey - Cache/Ulster University
- Stephanie Harcourt - Land & Property Services, Department of Finance
- Martin Hinch - Ulster University
- Lois Jackson - Lisburn & Castlereagh LA
- Simon Kelly – Department for Infrastructure
- Leona Maginn – Ards & North Down LA
- Stephen Martin - Department for Communities
- Martin McCauley – Royal Institute of Chartered Surveyors
- John McPeake - Radius Housing HA
- Michael McQuiston - Newry, Mourne & Down LA
- Nicola McCrudden – Chartered Institute of Housing, North Ireland
- Sharon Mossman - Antrim & Newtownabbey LA
- Robert Newell – Department of Infrastructure
- Laura O'Connor - Newry, Mourne & Down LA
- Dermot O'Kane – Belfast City Council
- James Sampson- Department for Communities
- Claire Williamson - Royal Town Planning Institute

Annex 4.2: Workshop slides

NI HOUSING MARKET AREAS

WORKSHOP TO REVIEW EMERGING OUTPUTS

10 & 11 MAY 2018

Purpose of workshop

- Introduce study and outputs to date
- Discuss how HMAs can support housing strategy and planning
- Involve you in firming up HMA boundaries for Northern Ireland

Project aims and approach

- Provide an updated spatial definition of broad functional housing market areas (HMAs) for Northern Ireland
- Explore the potential to define cross-border functional HMAs
- Explore how 'best fit' HMAs might be better aligned to the 11 Council boundaries
- Three main components: background review, data analysis and stakeholder engagement

Background

- Residential mobility is shaped by work, housing market, family situation and other networks
- Administrative boundaries rarely shape mobility, with the possible exception of school catchment areas
- Area where the large majority of households move house without also changing place of work
- Use of functional (or economic) becoming more prominent in spatial planning across Europe
- Not asked to define a set number of HMAs but NIHE were interested in whether fewer could be defined

Why are HMAs useful?

- Northern Ireland too large and local authorities can be too small to explore economic and housing market linkages
- Build a common and more robust evidence base
- See how local areas fit into the broader market and links between urban and rural areas
- Enable partners to make more strategic and collaborative decisions that may reduce risks of unwelcome spillovers

Trends in residential mobility

- Declining rates of residential mobility linked to:
  - Housing market conditions very different from 2001-7
  - Internal migration fallen in many advanced economies
  - Increase in less mobile households
- More short distance moves in both urban and rural areas
- Commuting flows across local authority boundaries mainly concentrated in the wider Belfast and surrounding area
- Lack of statistical evidence about cross-border mobility

Analysis of Medical Cards Register data

- 1,020,256 complete records: 2011- Oct' 2017
- Initially looked at flows for all cases aged 16+
- But main analysis is flows for 25-64 years
- Identified key settlements (seed points)
- Then sequential testing of flows:
  - Strong link (15+%) and no significant link (5%) from any other seed point
  - Moderate link (10+%) and no other significant flow
  - Flows from ward to seed points/other settlements
  - Overlapping areas and wards with no significant flow assigned to seed point or provisional HMA provision had link

Age band	number	%
0-15	249,823	24
16-24	144,125	14
25-64	**545,101**	**53**
65+	81,207	8
Total	**1,020,256**	**100.0**

Emerging findings for functional HMAs

HMA 2017 (first cut)	Estimated population*		Moves 25-64 years	Demand side self containment (%)
	No	%		
Ballymena HMA	66,635	3.6	19,610	80.1%
Belfast Metro' HMA	916,897	49.2	285,116	88.6%
Causeway Coast HMA	113,189	6.1	37,715	83.1%
Cookstown HMA	81,199	4.4	19,042	81.8%
Craigavon HMA	190,703	10.2	53,622	83.7%
Derry HMA	144,887	7.8	33,491	92.1%
Dungannon HMA	63,748	3.4	17,517	81.2%
Fermanagh HMA	63,493	3.4	23,757	91.4%
Newry HMA	132,754	7.1	34,274	88.4%
Omagh HMA	52,281	2.8	12,843	84.1%
Strabane HMA	35,602	1.9	8,114	89.2%
Total	1,862,187	100	545,101	(NA)

On-line demonstration

Summary of initial functional HMAs

- Some inevitable changes due to altered wards but HMAs appear to be fairly stable
- Believe may be 'border effects' on findings, especially for Derry HMA
- Transfer of wards from Belfast Metro' HMA to adjacent HMAs, mainly rural and Banbridge town
- Elsewhere, most HMAs largely unchanged
- No mergers, in contrast to 2011 TTWA

workshop questions

Views on functional HMAs

What do you agree with?

What would you change?

What would you seek to clarify?

SESSION 2

RECONCILING WITH PRACTICALITIES

What might 'best fit' HMAs look like?

Moving towards a 'best fit solution'

- Collating data at functional HMA level can be challenging
- Strategies, plans and partnerships involve single or multiple local authorities
- Potential to build on functional HMAs to evolve a set of "best fit" HMAs aligned to local authority boundaries
- Primarily policy issue, so important guided by stakeholder views
- Identified 3 groupings: happy to work through each?

Pointers for discussion

General	• What are the main reasons, potential benefits and risks of creating 'best fit' HMAs? • Are there existing formal or informal joint working arrangements that may have to be allowed for?
Belfast and Derry	• How might twin-demand overlap areas be managed? • What might be appropriate arrangements for handling non-aligned spaces such as Larne?
Mainly Rural HMA	• How might 'marginal' rural wards be assigned? • What are the pros and cons of grouping LAs to form a single unit for assessment that subsumes 2+ HMAs? • Are the any strategic issues that joint analysis might usefully shed light on?


Next Steps
Reflect on discussions from workshops and interviews
Firm up functional and best fit HMA proposals
Investigate local HMAs within the Belfast Metropolitan and Craigavon HMAs
Draft report by start June, with aim to finish by July
Welcome any further comments by 25 May 2018
Thank you

Annex 4.3: Estate Agent Exercise

Introduction

One element of the stakeholder engagement component of the study was to interview a small number of around 10-12 estate agents, drawing on a listing of estate agents supplied by the NIHE and information obtained from property professionals with a detailed knowledge of the housing market in Northern Ireland. The list of agents and property professionals that gave feedback and their office locations is presented below:

Estate Agent/Property Professional	HMA	Agent Office
CPS	Dungannon HMA	Dungannon
Maison Real Estate	Dungannon HMA	Dungannon
Country Estates	Belfast Metropolitan HMA	Ballyclare
Robert Wilson Estate Agency Group	Craigavon Urban Area HMA	Lurgan
Kernan Property Services	Newry HMA	Crossmaglen Office
Maneely & Co Ltd	Dungannon HMA	Dungannon
Rainey & Gregg	Ballymena HMA	Ballymena
Lennon Estates	Craigavon Urban Area HMA	Banbridge
Lindsay Fyfe & Co	Belfast Metropolitan HMA	Newtownards
Macfarlane & Smythe	Belfast Metropolitan HMA	Belfast
Dixon Contractors	Ballymena HMA	Ballymena

Initial telephone interviews with estate agents and property professionals highlighted that estate agents did not typically read the briefing paper and found it difficult describe their local market area precisely. As a result, subsequent telephone interviews were conducted alongside an online map based survey. This allowed agents to explore a simple map of each HMA and the associated local authority boundaries and to define their own local market areas. This revised approach allowed us to capture feedback more efficiently. The survey can be found at the end of this annex.

In light of the very low numbers of interviews carried out it is not possible to draw any significant conclusions from these responses but the interviews did highlight some useful common strands.

HMA boundaries

When asked to describe and draw their local market area (defined as the area where 75% or more of house buyers or private tenants came from), estate agents typically drew somewhat smaller areas than the broad HMAs derived from our analysis of MCR data. For instance, estate agents that covered the Craigavon area typically identified an area that included the CUA and Banbridge but did not extend south to Armagh. Likewise, estate agents in Dungannon typically excluded the area in the south east wedge of the area, consistent with our impression of the essentially unaligned nature of the localised housing market in the Fivemiletown, Augher and Clogher area.

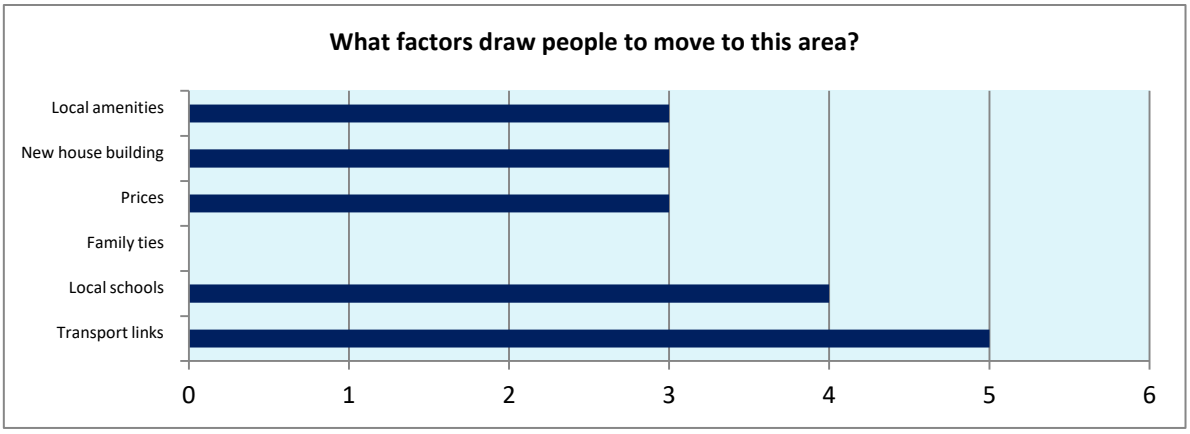
Discussions indicated that the reasons for this were twofold. First, representatives from local estate agents and letting offices reported that they operate in fairly tight catchment areas and by and large serve local clients. Second, those moving house, especially private renters, typically consider a fairly narrow number of possible locations.

On the other hand none of the 11 estate agents that we interviewed identified locations where the broad HMA boundary was inappropriate. Nor did they offer any comments to suggest that the broad

HMAs were inappropriate. This suggests a general acceptance of the HMA boundaries as they were presented.

Factors that draw people to move to the local area

Transport links and good local schools were the most commonly cited factors that attracted people to a local area. Other factors mentioned included the provision of local amenities, new house building and prices. Curiously and unexpectedly, none of the estate agent identified family ties as a factor associated with a move to an area, though it should be emphasised that this is from a low base of respondents.



Housing market performance

In terms of the performance of the market, the general impression of estate agents was that sales and lettings volumes had picked up from the lows of seven years ago, which is broadly consistent with various published housing market statistics.

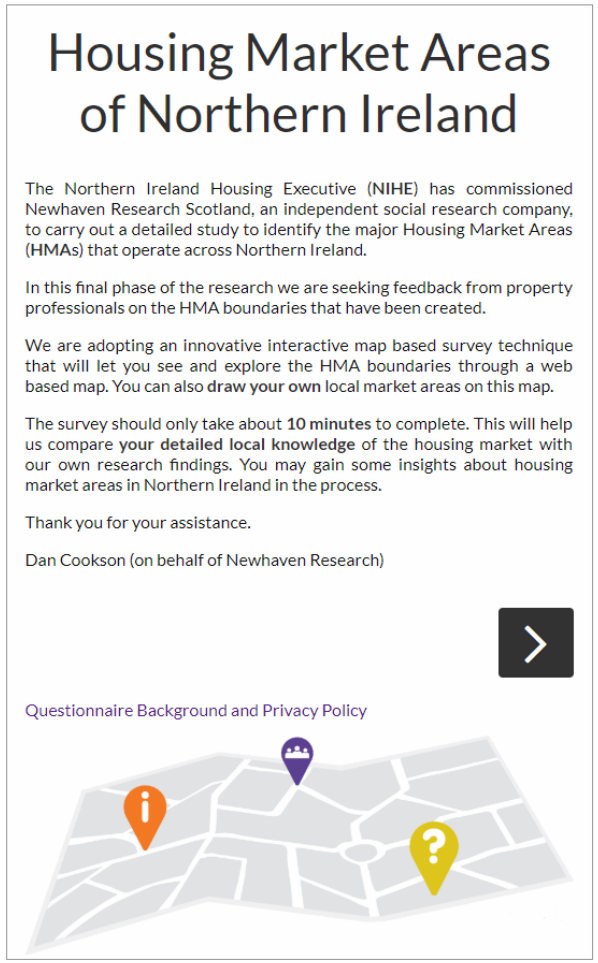
> *"There is currently a lack of supply in rental housing in 2018. Sales wise the market has improved notably since 2014"*
>
> *"Steady increase until the second home tax came in place. It has slowed down since then."*

Profile of people searching for housing

Estate agents reported that first time buyers generally made up the largest proportion of their client base although a few agents in one or two locations also suggested that retirees were equally important. .

When asked, estate agents offered no view on whether the geography of the broad HMA housing market might change in the next few years, but one or two believed their own local market areas might expand in the future.

Screenshots of online survey distributed to estate agents



Housing Market Areas of Northern Ireland

The Northern Ireland Housing Executive (**NIHE**) has commissioned Newhaven Research Scotland, an independent social research company, to carry out a detailed study to identify the major Housing Market Areas (**HMAs**) that operate across Northern Ireland.

In this final phase of the research we are seeking feedback from property professionals on the HMA boundaries that have been created.

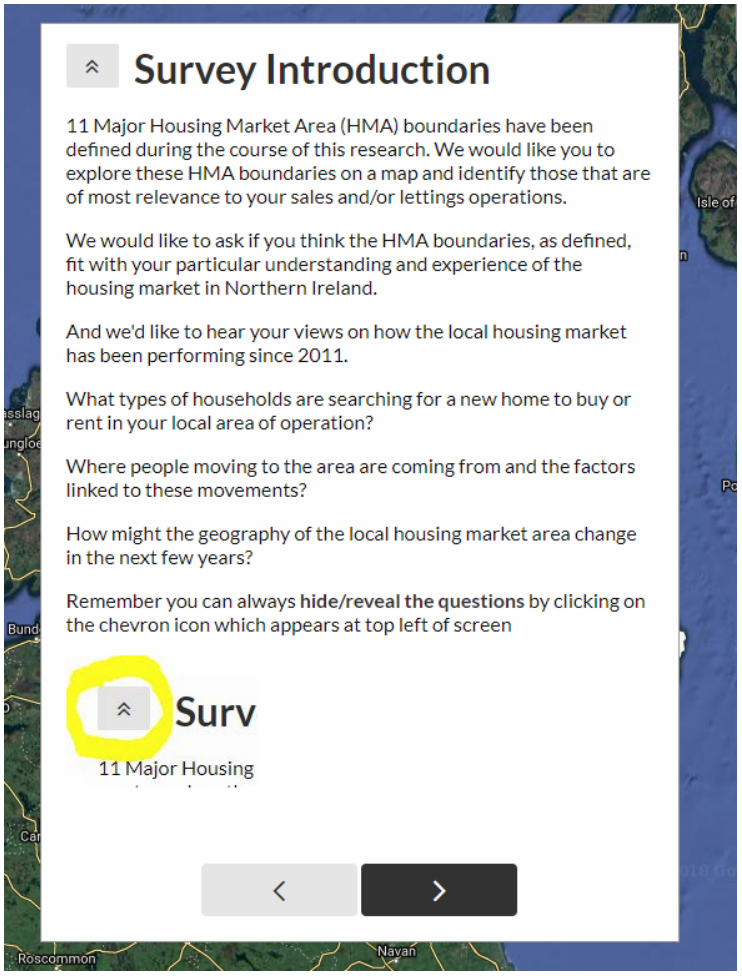
We are adopting an innovative interactive map based survey technique that will let you see and explore the HMA boundaries through a web based map. You can also **draw your own** local market areas on this map.

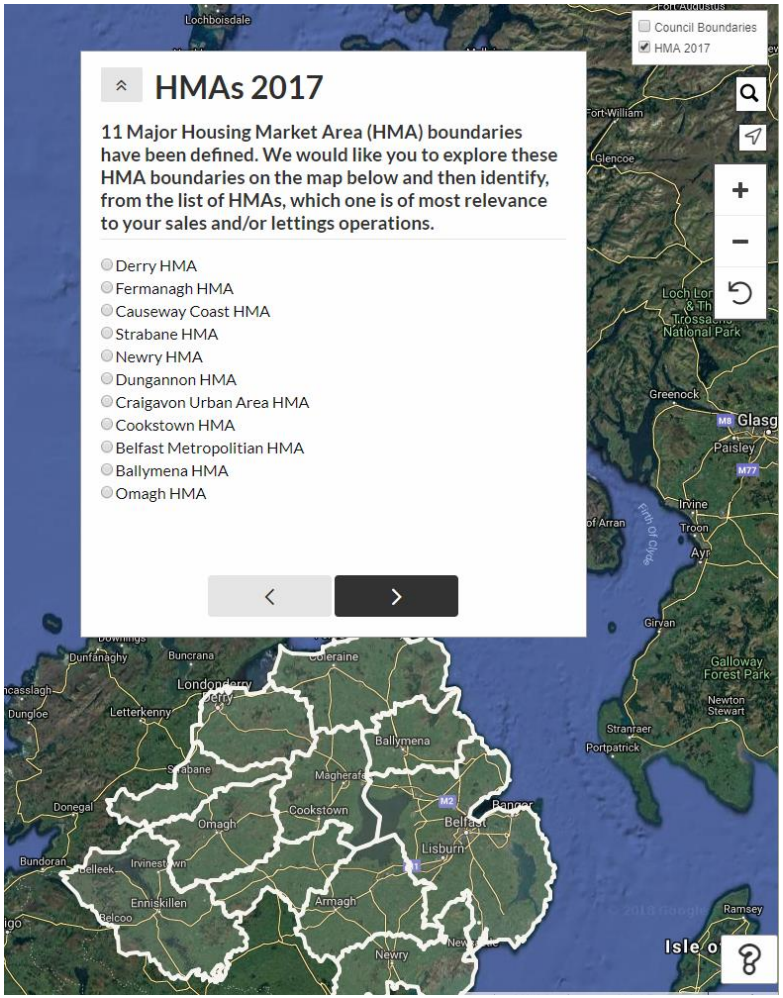
The survey should only take about **10 minutes** to complete. This will help us compare **your detailed local knowledge** of the housing market with our own research findings. You may gain some insights about housing market areas in Northern Ireland in the process.

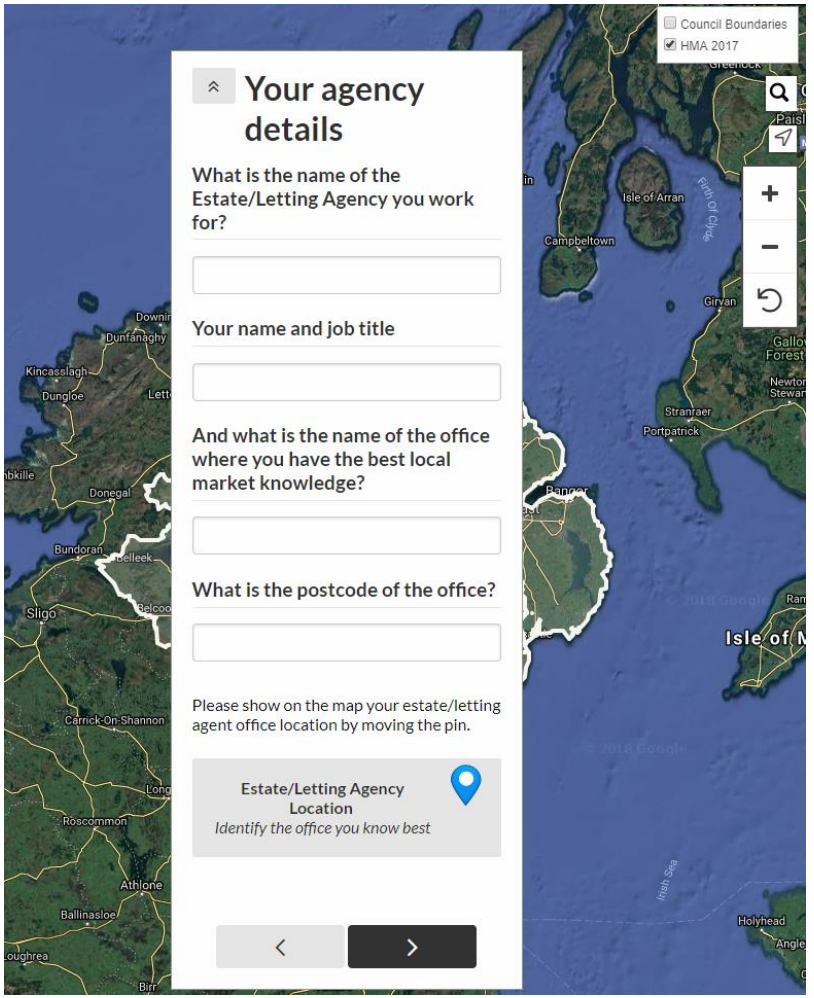
Thank you for your assistance.

Dan Cookson (on behalf of Newhaven Research)

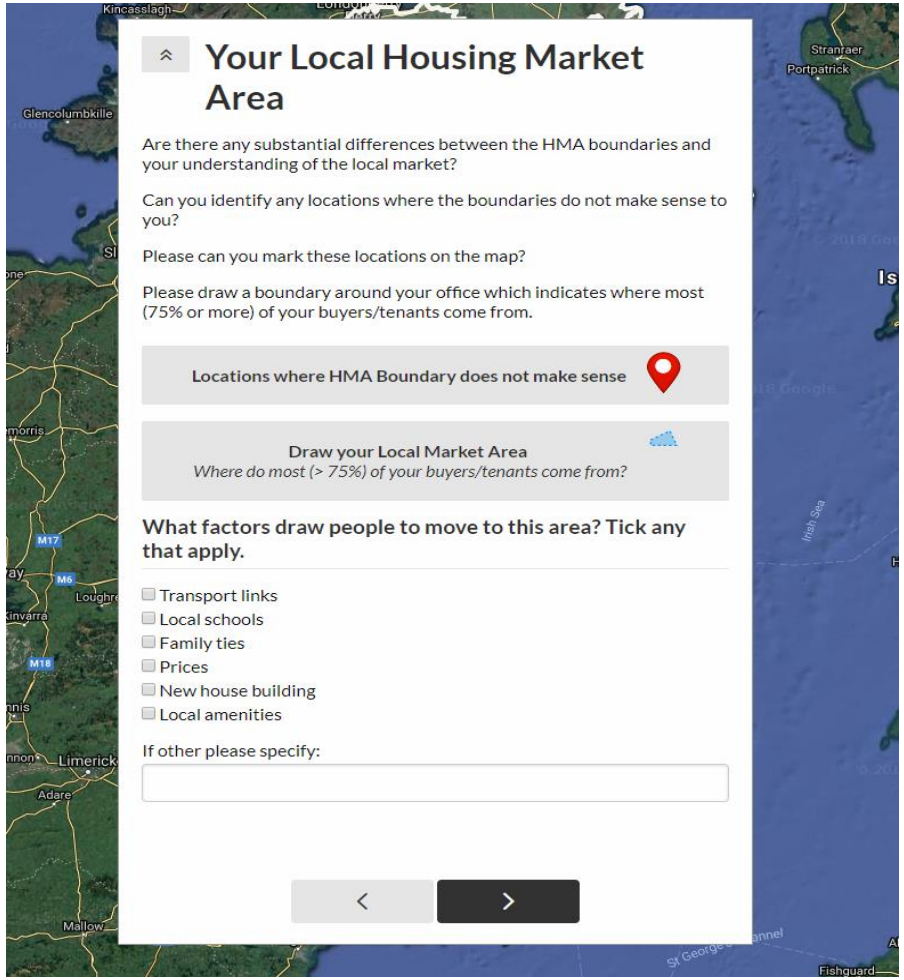
Questionnaire Background and Privacy Policy

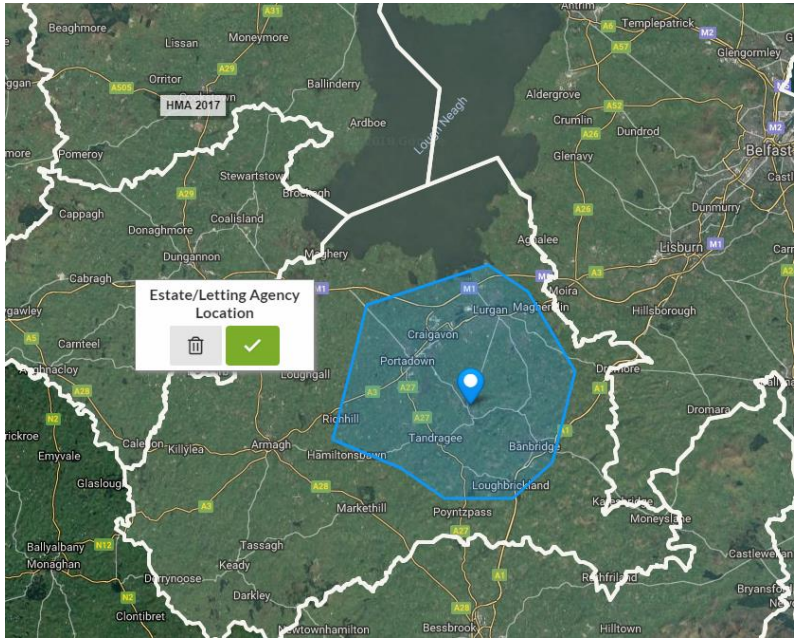


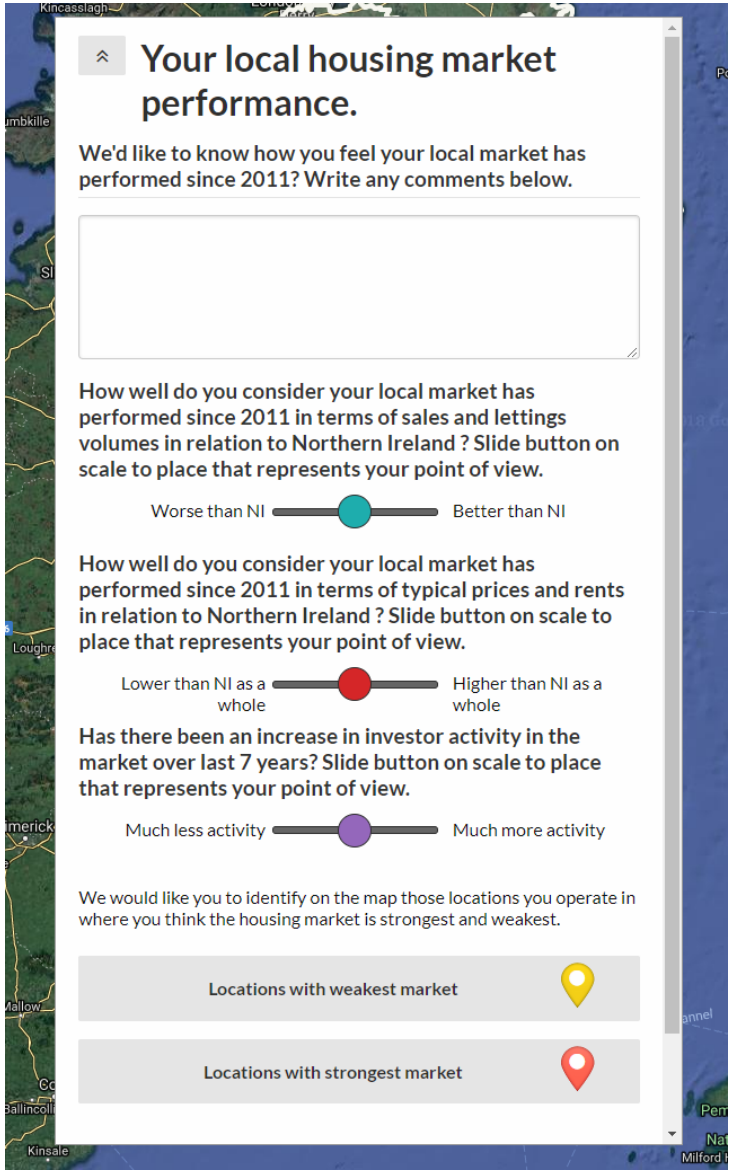

Council Boundaries
HMA 2017
HMAs 2017
11 Major Housing Market Area (HMA) boundaries have been defined. We would like you to explore these HMA boundaries on the map below and then identify, from the list of HMAs, which one is of most relevance to your sales and/or lettings operations.
Derry HMA
Fermanagh HMA
Causeway Coast HMA
Strabane HMA
Newry HMA
Dungannon HMA
Craigavon Urban Area HMA
Cookstown HMA
Belfast Metropolitian HMA
Ballymena HMA
Omagh HMA

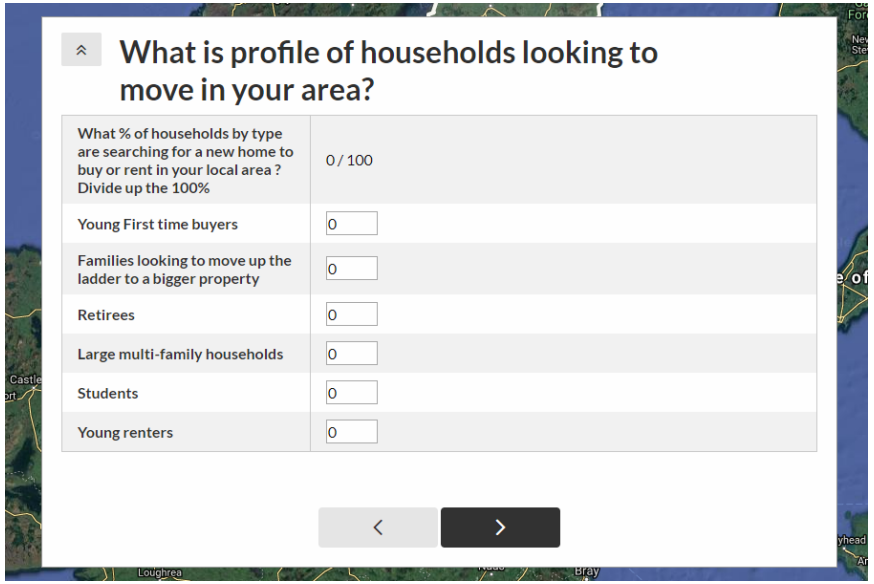

Council Boundaries
HMA 2017
Your agency details
What is the name of the Estate/Letting Agency you work for?
Your name and job title
And what is the name of the office where you have the best local market knowledge?
What is the postcode of the office?
Please show on the map your estate/letting agent office location by moving the pin.
Estate/Letting Agency Location
Identify the office you know best

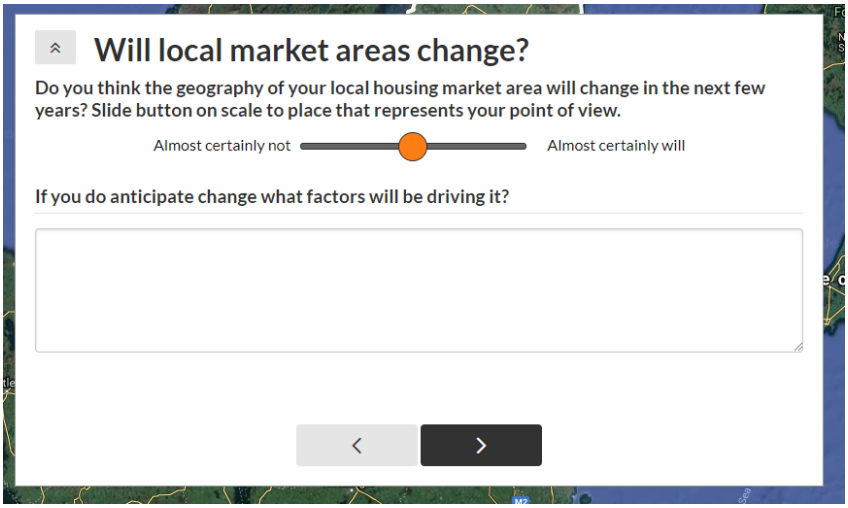
Agents were able to locate their office and draw a boundary describing their own local market areas on the interactive map

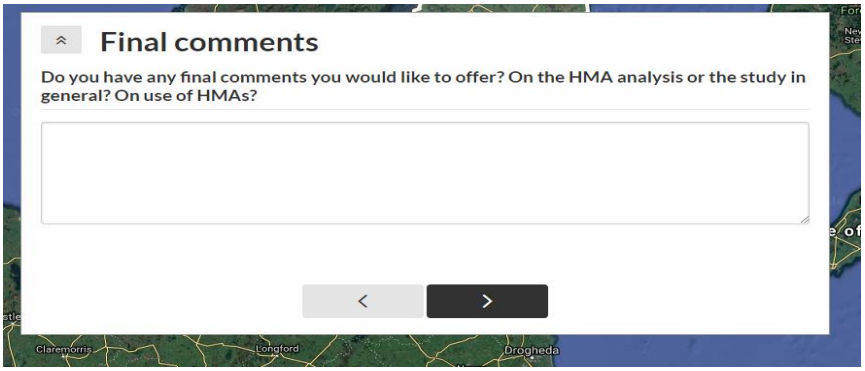


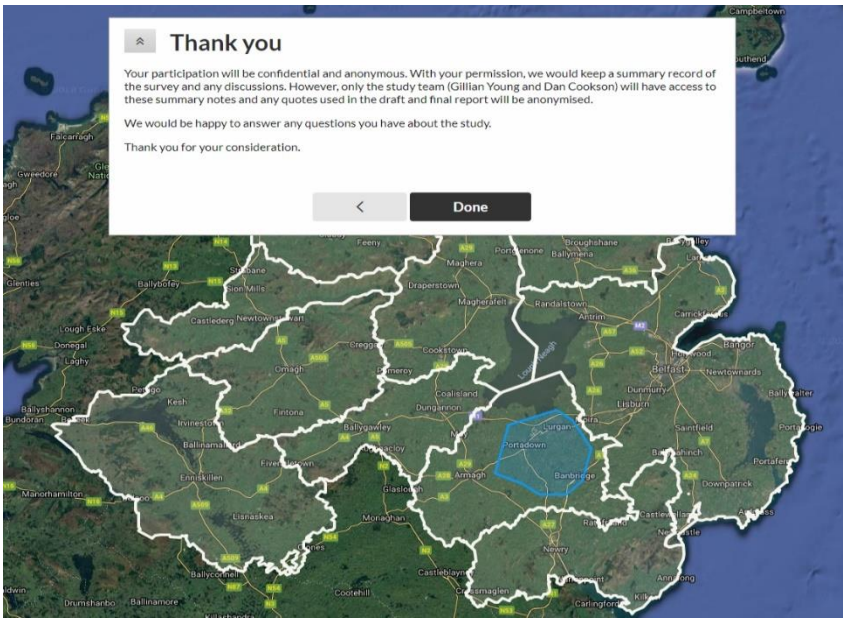



Your local housing market performance.
We'd like to know how you feel your local market has performed since 2011? Write any comments below.
How well do you consider your local market has performed since 2011 in terms of sales and lettings volumes in relation to Northern Ireland ? Slide button on scale to place that represents your point of view.
Worse than NI
Better than NI
How well do you consider your local market has performed since 2011 in terms of typical prices and rents in relation to Northern Ireland ? Slide button on scale to place that represents your point of view.
Lower than NI as a whole
Higher than NI as a whole
Has there been an increase in investor activity in the market over last 7 years? Slide button on scale to place that represents your point of view.
Much less activity
Much more activity
We would like you to identify on the map those locations you operate in where you think the housing market is strongest and weakest.
Locations with weakest market
Locations with strongest market


What is profile of households looking to move in your area?
What % of households by type are searching for a new home to buy or rent in your local area ? Divide up the 100%
0 / 100
Young First time buyers
0
Families looking to move up the ladder to a bigger property
0
Retirees
0
Large multi-family households
0
Students
0
Young renters
0


Will local market areas change?
Do you think the geography of your local housing market area will change in the next few years? Slide button on scale to place that represents your point of view.
Almost certainly not
Almost certainly will
If you do anticipate change what factors will be driving it?


Final comments
Do you have any final comments you would like to offer? On the HMA analysis or the study in general? On use of HMAs?

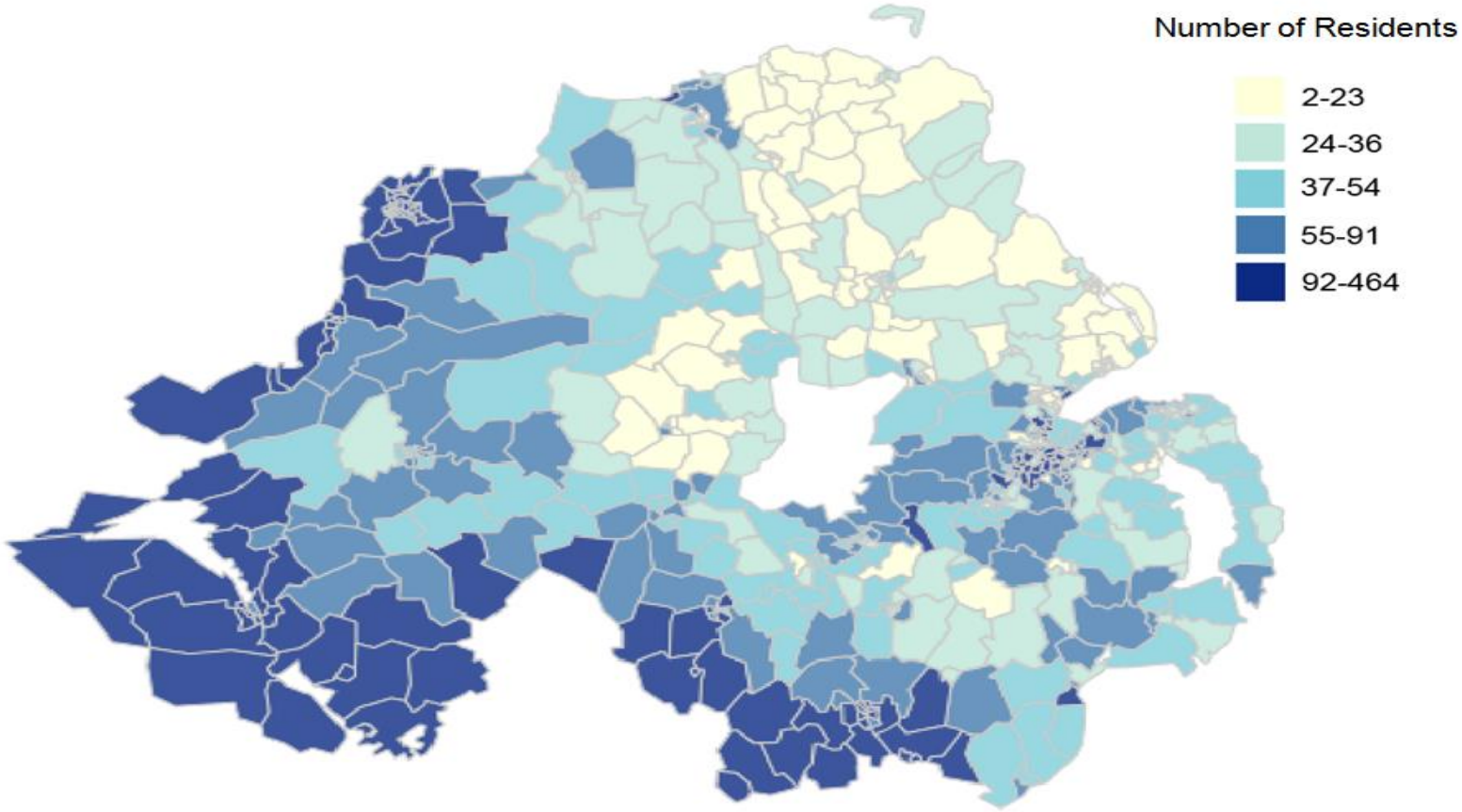

Thank you
Your participation will be confidential and anonymous. With your permission, we would keep a summary record of the survey and any discussions. However, only the study team (Gillian Young and Dan Cookson) will have access to these summary notes and any quotes used in the draft and final report will be anonymised.
We would be happy to answer any questions you have about the study.
Thank you for your consideration.
Done

Appendix 5: Supplementary Census analysis

Table A5.1: All usual residents living in the Ireland one year ago, Census 2011 (N)

usual residence	Aged 1 and over	Aged 1-15	Aged 16-49	Aged 50-64	Aged 65-74	Aged 75+
Antrim	36	4	27	3	2	0
Ards	34	6	23	3	0	2
Armagh	142	19	93	15	8	7
Ballymena	45	12	30	2	0	1
Ballymoney	18	1	13	1	1	2
Banbridge	52	8	39	3	2	0
Belfast	644	36	549	34	10	15
Carrickfergus	14	0	14	0	0	0
Castlereagh	53	13	35	4	0	1
Coleraine	150	7	126	10	5	2
Cookstown	35	6	20	8	1	0
Craigavon	76	11	53	8	4	0
Derry	392	47	263	43	19	20
Down	74	9	45	9	8	3
Dungannon	149	27	100	11	6	5
Fermanagh	337	38	212	56	15	16
Larne	9	0	7	1	1	0
Limavady	50	6	33	8	1	2
Lisburn	90	16	57	13	2	2
Magherafelt	43	8	29	3	0	3
Moyle	21	3	10	7	1	0
Newry and Mourne	324	68	210	23	12	11
Newtownabbey	00123	5	114	3	1	0
North Down	62	14	34	10	2	2
Omagh	70	4	44	14	5	3
Strabane	138	20	86	14	4	14
Northern Ireland	3,181	388	2,266	306	110	111
Source: Census 2011 -MM01CUK_NON_UK - Origin and destination of international migrants						
In order to protect against disclosure of personal information, records have been swapped between different geographic areas. Some counts will be affected, particularly small counts at the lowest geographies.						

Figure A5.1: Number of residents living in Northern Ireland who were born in Ireland by ward, 2011



Source: NISRA -2011 Census, table QS208NI, mapped by AIRO

Table A5.2: Residents of Northern Ireland working/studying in Ireland and residents of Ireland working/studying in Northern Ireland, by age and sex, 2011 (N)

Age group	All usual residents of Northern Ireland aged 16 to 74 working/studying in Ireland			All usual residents of Ireland aged 16 to 74 working/studying in Northern Ireland		
	Males	Females	Total	Males	Females	Total
16-24	396	396	792	768	1,054	1,822
25-34	1,091	1,056	2,147	937	1,259	2,196
35-44	1,072	726	1,798	1,175	1,141	2,316
45-54	751	409	1,160	623	735	1,358
55-64	322	167	489	273	279	552
65-74	49	21	70	35	16	51
Total	3,681	2,775	6,456	3,811	4,484	8,295
Source: Census of Population, CSO and Census of Population, NISRA						

Table A5.3: Migration at LGD 2014 Level 2011 Census – all persons aged 1 year or over (N)

Previous LGD code(2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	5,738	138	1,362	286	66	57	260	667	137	180	229	9,120
Armagh, Banbridge and Craigavon	251	9,833	1,080	255	82	92	507	161	319	536	182	13,298
Belfast	1,022	478	23,080	485	270	272	2,623	424	313	570	1,015	30,552
Causeway Coast and Glens	263	71	810	7,382	248	117	103	270	220	42	67	9,593
Derry and Strabane	177	54	653	496	7,195	251	57	43	184	42	39	9,191
Fermanagh and Omagh	89	73	638	209	223	4,989	74	21	229	36	32	6,613
Lisburn and Castlereagh	245	496	2,120	270	74	47	4,907	92	65	295	369	8,980
Mid and East Antrim	669	184	749	369	61	19	141	6,364	110	127	122	8,915
Mid Ulster	187	305	786	386	133	194	77	103	5,695	38	43	7,947
Newry, Mourne and Down	286	609	1,173	111	62	32	257	117	28	8,176	241	11,092
North Down and Ards	204	114	1,242	162	27	25	304	129	45	284	7,881	10,417
England	817	671	1,889	635	523	514	924	461	453	758	1,085	8,730
Scotland	155	208	509	173	129	98	199	148	111	111	267	2,108
Wales	30	38	66	29	19	10	47	15	11	29	42	336
Other	838	1,497	3,255	879	1,129	1,079	758	663	1,515	1,182	797	13,592
Total Current Address	10,971	14,769	39,412	12,127	10,241	7,796	11,238	9,678	9,435	12,406	12,411	150,484
Source: Source: Data from census table MM01CUK_ via NOMIS												

Table A.5.4: UK based migration flows within Northern Ireland, 2011 (%)

Previous LGD code(2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	52.3	0.9	3.5	2.4	0.6	0.7	2.3	6.9	1.5	1.5	1.8	6.1
Armagh, Banbridge and Craigavon	2.3	66.6	2.7	2.1	0.8	1.2	4.5	1.7	3.4	4.3	1.5	8.8
Belfast	9.3	3.2	58.6	4.0	2.6	3.5	23.3	4.4	3.3	4.6	8.2	20.3
Causeway Coast and Glens	2.4	0.5	2.1	60.9	2.4	1.5	0.9	2.8	2.3	0.3	0.5	6.4
Derry and Strabane	1.6	0.4	1.7	4.1	70.3	3.2	0.5	0.4	2.0	0.3	0.3	6.1
Fermanagh and Omagh	0.8	0.5	1.6	1.7	2.2	64.0	0.7	0.2	2.4	0.3	0.3	4.4
Lisburn and Castlereagh	2.2	3.4	5.4	2.2	0.7	0.6	43.7	1.0	0.7	2.4	3.0	6.0
Mid and East Antrim	6.1	1.2	1.9	3.0	0.6	0.2	1.3	65.8	1.2	1.0	1.0	5.9
Mid Ulster	1.7	2.1	2.0	3.2	1.3	2.5	0.7	1.1	60.4	0.3	0.3	5.3
Newry, Mourne and Down	2.6	4.1	3.0	0.9	0.6	0.4	2.3	1.2	0.3	65.9	1.9	7.4
North Down and Ards	1.9	0.8	3.2	1.3	0.3	0.3	2.7	1.3	0.5	2.3	63.5	6.9
England	7.4	4.5	4.8	5.2	5.1	6.6	8.2	4.8	4.8	6.1	8.7	5.8
Scotland	1.4	1.4	1.3	1.4	1.3	1.3	1.8	1.5	1.2	0.9	2.2	1.4
Wales	0.3	0.3	0.2	0.2	0.2	0.1	0.4	0.2	0.1	0.2	0.3	0.2
Other	7.6	10.1	8.3	7.2	11.0	13.8	6.7	6.9	16.1	9.5	6.4	9.0
Total Current Address	100	100	100	100	100	100	100	100	100	100	100	100
Source: Data from census table MM01CUK_ via NOMIS												

Table A5.5: Internal Migration flows between Northern Ireland local Authorities, 2011 (%)

Previous LGD code(2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	62.8	1.1	4.0	2.7	0.8	0.9	2.8	7.9	1.9	1.7	2.2	7.3
Armagh, Banbridge and Craigavon	2.7	79.6	3.2	2.4	1.0	1.5	5.4	1.9	4.3	5.2	1.8	10.6
Belfast	11.2	3.9	68.5	4.7	3.2	4.5	28.2	5.1	4.3	5.5	9.9	24.3
Causeway Coast and Glens	2.9	0.6	2.4	70.9	2.9	1.9	1.1	3.2	3.0	0.4	0.7	7.6
Derry and Strabane	1.9	0.4	1.9	4.8	85.2	4.1	0.6	0.5	2.5	0.4	0.4	7.3
Fermanagh and Omagh	1.0	0.6	1.9	2.0	2.6	81.9	0.8	0.3	3.1	0.3	0.3	5.3
Lisburn and Castlereagh	2.7	4.0	6.3	2.6	0.9	0.8	52.7	1.1	0.9	2.9	3.6	7.1
Mid and East Antrim	7.3	1.5	2.2	3.5	0.7	0.3	1.5	75.8	1.5	1.2	1.2	7.1
Mid Ulster	2.0	2.5	2.3	3.7	1.6	3.2	0.8	1.2	77.5	0.4	0.4	6.3
Newry, Mourne and Down	3.1	4.9	3.5	1.1	0.7	0.5	2.8	1.4	0.4	79.2	2.4	8.8
North Down and Ards	2.2	0.9	3.7	1.6	0.3	0.4	3.3	1.5	0.6	2.8	77.1	8.3
Total Current Address	100	100	100	100	100	100	100	100	100	100	100	100
Source: Data from census table MM01CUK_ via NOMIS.												

Table A5.6: Census commuting flows by NI Local Authority area, 2011 (N)

Workplace LGD (2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	23,787	1,471	6,661	1,231	197	187	2,689	8,420	1,717	888	1,812	49,060
Armagh, Banbridge and Craigavon	472	44,123	1,194	172	108	364	2,156	467	2,749	3,166	459	55,430
Belfast	19,645	8,023	90,753	2,120	818	873	23,958	10,333	2,802	7,657	20,421	187,403
Causeway Coast and Glens	288	109	233	28,720	1,577	400	88	1,056	1,459	44	65	34,039
Derry and Strabane	94	46	177	3,720	34,352	1,362	79	99	1,125	39	48	41,141
Fermanagh and Omagh	35	198	160	481	2,263	26,956	56	32	1,731	50	29	31,991
Lisburn and Castlereagh	1,784	5,050	8,523	278	94	134	19,743	855	349	2,806	4,506	44,122
Mid and East Antrim	4,100	565	1,356	3,490	130	78	474	26,311	1,135	419	479	38,537
Mid Ulster	642	2,519	325	1,438	707	1,892	303	545	28,640	221	101	37,333
Newry, Mourne and Down	370	4,009	854	45	38	73	1,091	341	184	33,738	903	41,646
North Down and Ards	783	469	2,825	93	31	43	1,565	397	77	1,060	27,033	34,376
England	356	495	680	360	402	322	378	378	294	523	436	4,624
Scotland	54	216	129	89	129	72	59	86	84	90	151	1,159
Wales	27	18	53	13	13	11	37	19	11	19	211	432
Works from home	5,814	9,427	11,147	7,529	5,984	7,219	6,063	6,030	8,545	8,789	6,828	83,375
Offshore	64	78	130	56	56	45	44	121	58	88	121	861
No fixed place	7,340	12,053	14,400	9,237	7,580	8,221	7,622	7,566	10,623	12,619	9,199	106,460
Outside UK	170	817	404	248	1,361	1,359	245	158	424	1,873	198	7,257
Total	65,825	89,686	140,004	59,320	55,840	49,611	66,650	63,214	62,007	74,089	73,000	799,246

Source: Census 2011 Table number: WU02UK_msoa: local authorities created using NISRA best fit guidance

Table A5.7: Census commuting flows by NI Local Authority area, 2011, (%)

Workplace LGD (2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	36.1	1.6	4.8	2.1	0.4	0.4	4.0	13.3	2.8	1.2	2.5	6.1
Armagh, Banbridge and Craigavon	0.7	49.2	0.9	0.3	0.2	0.7	3.2	0.7	4.4	4.3	0.6	6.9
Belfast	29.8	8.9	64.8	3.6	1.5	1.8	35.9	16.3	4.5	10.3	28.0	23.4
Causeway Coast and Glens	0.4	0.1	0.2	48.4	2.8	0.8	0.1	1.7	2.4	0.1	0.1	4.3
Derry and Strabane	0.1	0.1	0.1	6.3	61.5	2.7	0.1	0.2	1.8	0.1	0.1	5.1
Fermanagh and Omagh	0.1	0.2	0.1	0.8	4.1	54.3	0.1	0.1	2.8	0.1	0.0	4.0
Lisburn and Castlereagh	2.7	5.6	6.1	0.5	0.2	0.3	29.6	1.4	0.6	3.8	6.2	5.5
Mid and East Antrim	6.2	0.6	1.0	5.9	0.2	0.2	0.7	41.6	1.8	0.6	0.7	4.8
Mid Ulster	1.0	2.8	0.2	2.4	1.3	3.8	0.5	0.9	46.2	0.3	0.1	4.7
Newry, Mourne and Down	0.6	4.5	0.6	0.1	0.1	0.1	1.6	0.5	0.3	45.5	1.2	5.2
North Down and Ards	1.2	0.5	2.0	0.2	0.1	0.1	2.3	0.6	0.1	1.4	37.0	4.3
England	0.5	0.6	0.5	0.6	0.7	0.6	0.6	0.6	0.5	0.7	0.6	0.6
Scotland	0.1	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1
Wales	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.1
Works from home	8.8	10.5	8.0	12.7	10.7	14.6	9.1	9.5	13.8	11.9	9.4	10.4
Offshore	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
No fixed place	11.2	13.4	10.3	15.6	13.6	16.6	11.4	12.0	17.1	17.0	12.6	13.3
Outside UK	0.3	0.9	0.3	0.4	2.4	2.7	0.4	0.2	0.7	2.5	0.3	0.9
Total	100	100	100	100	100	100	100	100	100	100	100	100

Source: Census 2011 Table number: WU02UK_msoa:
Note: local authorities estimated based on aggregating SOA data using NISRA best fit guidance

Appendix 6: Supplementary analysis of Medical Card Registrations data

Table A6.1: MCR valid cases broken down by age band and Local Authority area

Current area	All	0-15		16-34		35-54		55-64		65+	
		No	%	No	%	No	%	No	%	No	%
Antrim & Newtownabbey	73,947	18,457	7.4	27,345	7.2	18,080	7.3	4,102	6.9	5,963	7.3
Armagh City, Banbridge & Craigavon	88,508	20,735	8.3	29,192	7.7	22,106	8.9	6,293	10.5	10,182	12.5
Ards and North Down	109,439	29,069	11.6	41,272	10.8	26,316	10.6	5,621	9.4	7,161	8.8
Belfast	221,211	48,771	19.5	94,472	24.8	52,171	21.0	11,253	18.9	14,544	17.9
Causeway Coast & Glens	74,569	18,696	7.5	26,428	6.9	18,154	7.3	4,658	7.8	6,633	8.2
Derry City and Strabane	77,774	20,609	8.2	28,916	7.6	19,353	7.8	4,468	7.5	4,428	5.5
Fermanagh & Omagh	68,650	16,095	6.4	22,059	5.8	17,113	6.9	5,843	9.8	7,540	9.3
Lisburn & Castlereagh	72,823	17,513	7.0	25,684	6.7	18,590	7.5	4,388	7.4	6,648	8.2
Mid & East Antrim	76,354	18,165	7.3	27,709	7.3	18,607	7.5	4,643	7.8	7,230	8.9
Mid Ulster	67,115	17,612	7.0	26,082	6.8	15,977	6.4	3,186	5.3	4,258	5.2
Newry, Mourne & Down	89,866	24,101	9.6	32,244	8.5	21,665	8.7	5,236	8.8	6,620	8.2
Northern Ireland	1,020,256	249,823	100	381,403	100	248,132	100	59,691	100	81,207	100
Source: MCR dataset- Newhaven analysis											

Table A6.2: Local Government District Flows (N)

Migration between Local Government Districts persons aged 25-64												
	LGD current (2014)											
Previous LGD (2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	28,262	357	3,850	521	146	151	1,016	2,827	449	197	554	38,330
Armagh City, Banbridge and Craigavon	275	49,682	1,468	240	120	265	1,971	246	1,154	1,747	388	57,556
Belfast	5,512	1,465	99,179	950	735	688	9,677	1,674	820	2,071	4,366	127,137
Causeway Coast and Glens	469	199	1,048	33,016	890	141	286	1,048	626	128	239	38,090
Derry City and Strabane	169	152	978	1,217	37,818	724	202	139	248	121	118	41,886
Fermanagh and Omagh	126	309	717	157	574	33,310	241	73	780	146	149	36,582
Lisburn and Castlereagh	852	2,049	5,687	235	117	196	23,759	358	228	1,195	1,709	36,385
Mid and East Antrim	2,720	230	1,601	1,091	98	72	454	32,600	462	192	430	39,950
Mid Ulster	491	1,348	891	685	189	813	260	450	31,490	209	112	36,938
Newry, Mourne and Down	202	2,047	1,724	124	98	126	1,132	170	201	40,550	778	47,152
Ards and North Down	440	353	3,347	228	71	114	1,443	338	101	758	37,902	45,095
Total	39,518	58,191	120,490	38,464	40,856	36,600	40,441	39,923	36,559	47,314	46,745	545,101
Source: The Medical Card Register 2011-2017 Newhaven Analysis												

Table A6.3: Local Government District Flows (%)

Migration between Local Government Districts persons aged 25-64												
	LGD current (2014)											
Previous LGD (2014)	Antrim and Newtownabbey	Armagh, Banbridge and Craigavon	Belfast	Causeway Coast and Glens	Derry and Strabane	Fermanagh and Omagh	Lisburn and Castlereagh	Mid and East Antrim	Mid Ulster	Newry, Mourne and Down	Ards & North Down	Total
Antrim and Newtownabbey	71.5	0.6	3.2	1.4	0.4	0.4	2.5	7.1	1.2	71.5	0.6	3.2
Armagh City, Banbridge and Craigavon	0.7	85.4	1.2	0.6	0.3	0.7	4.9	0.6	3.2	0.7	85.4	1.2
Belfast	13.9	2.5	82.3	2.5	1.8	1.9	23.9	4.2	2.2	13.9	2.5	82.3
Causeway Coast and Glens	1.2	0.3	0.9	85.8	2.2	0.4	0.7	2.6	1.7	1.2	0.3	0.9
Derry City and Strabane	0.4	0.3	0.8	3.2	92.6	2.0	0.5	0.3	0.7	0.4	0.3	0.8
Fermanagh and Omagh	0.3	0.5	0.6	0.4	1.4	91.0	0.6	0.2	2.1	0.3	0.5	0.6
Lisburn and Castlereagh	2.2	3.5	4.7	0.6	0.3	0.5	58.7	0.9	0.6	2.2	3.5	4.7
Mid and East Antrim	6.9	0.4	1.3	2.8	0.2	0.2	1.1	81.7	1.3	6.9	0.4	1.3
Mid Ulster	1.2	2.3	0.7	1.8	0.5	2.2	0.6	1.1	86.1	1.2	2.3	0.7
Newry, Mourne and Down	0.5	3.5	1.4	0.3	0.2	0.3	2.8	0.4	0.5	0.5	3.5	1.4
Ards and North Down	1.1	0.6	2.8	0.6	0.2	0.3	3.6	0.8	0.3	1.1	0.6	2.8
Total	100	100	100	100	100	100	100	100	100	100	100	100
Source: The Medical Card Register 2011-2017 Newhaven Analysis												

Table A6.4: Housing Market Areas Flows (N)

Flows between Housing Market Areas persons aged 25-64												
	Current HMA (2018)											
Previous HMA (2018)	Ballymena HMA	Belfast Metropolitan HMA	Causeway Coast HMA	Cookstown HMA	Craigavon Urban Area HMA	Derry HMA	Dungannon HMA	Fermangh HMA	Newry HMA	Omagh HMA	Strabane HMA	Total
Ballymena HMA	16,546	2,334	920	364	95	67	35	14	40	23	6	20,444
Belfast Metropolitan HMA	2,315	270,939	1,913	1,104	4,496	1,161	633	790	2,487	439	215	286,492
Causeway Coast HMA	874	1,940	25,623	459	166	794	41	72	63	37	45	30,114
Cookstown HMA	364	1,159	514	15,620	202	189	768	46	42	158	23	19,085
Craigavon Urban Area HMA	120	4,442	205	149	47,602	112	993	150	1,393	106	32	55,304
Derry HMA	114	1,541	919	228	132	37,773	57	101	79	130	396	41,470
Dungannon HMA	32	736	65	814	1,125	56	14,288	282	101	327	27	17,853
Fermangh HMA	15	774	58	50	154	95	216	21,719	58	355	61	23,555
Newry HMA	49	2,446	66	44	1,646	64	93	63	24,854	27	13	29,365
Omagh HMA	18	553	62	164	146	137	350	433	43	10,803	318	13,027
Strabane HMA	6	325	39	46	43	374	43	87	13	438	6,978	8,392
Total	20,453	287,189	30,384	19,042	55,807	40,822	17,517	23,757	29,173	12,843	8,114	545,101
Source: The Medical Card Register 2011-2017 Newhaven Analysis												

Table A6.5: Housing Market Areas Flows (%)

Flows between Housing Market Areas persons aged 25-64												
	Current HMA (2018)											
Previous HMA (2018)	Ballymena HMA	Belfast Metropolitan HMA	Causeway Coast HMA	Cookstown HMA	Craigavon Urban Area HMA	Derry HMA	Dungannon HMA	Fermangh HMA	Newry HMA	Omagh HMA	Strabane HMA	Total
Ballymena HMA	80.9	0.8	3.0	1.9	0.2	0.2	0.2	0.1	0.1	0.2	0.1	3.8
Belfast Metropolitan HMA	11.3	94.3	6.3	5.8	8.1	2.8	3.6	3.3	8.5	3.4	2.6	52.6
Causeway Coast HMA	4.3	0.7	84.3	2.4	0.3	1.9	0.2	0.3	0.2	0.3	0.6	5.5
Cookstown HMA	1.8	0.4	1.7	82.0	0.4	0.5	4.4	0.2	0.1	1.2	0.3	3.5
Craigavon Urban Area HMA	0.6	1.5	0.7	0.8	85.3	0.3	5.7	0.6	4.8	0.8	0.4	10.1
Derry HMA	0.6	0.5	3.0	1.2	0.2	92.5	0.3	0.4	0.3	1.0	4.9	7.6
Dungannon HMA	0.2	0.3	0.2	4.3	2.0	0.1	81.6	1.2	0.3	2.5	0.3	3.3
Fermangh HMA	0.1	0.3	0.2	0.3	0.3	0.2	1.2	91.4	0.2	2.8	0.8	4.3
Newry HMA	0.2	0.9	0.2	0.2	2.9	0.2	0.5	0.3	85.2	0.2	0.2	5.4
Omagh HMA	0.1	0.2	0.2	0.9	0.3	0.3	2.0	1.8	0.1	84.1	3.9	2.4
Strabane HMA	0.0	0.1	0.1	0.2	0.1	0.9	0.2	0.4	0.0	3.4	86.0	1.5
Total	100	100	100	100	100	100	100	100	100	100	100	100
Source: The Medical Card Register 2011-2017 Newhaven Analysis												

Table A6.6: Belfast Local Housing Market Areas Flows (N)

Belfast Local HMA containment persons aged 25-64					
	Current Belfast Sub HMA 2018 (June)				
Previous Belfast Sub HMA 2018	BMHMA-Central	BMHMA-Antrim	BMHMA-Ards and Down	N/A	Total
BMHMA-Central	154,418	7,643	8,420	9,753	180,234
BMHMA-Antrim	6,236	45,631	680	3,545	56,092
BMHMA-Ards and Down	7,661	597	39,653	2,255	50,166
Outside Belfast HMA	10,594	3,321	2,335	242,359	258,609
Total	178,909	57,192	51,088	257,912	545,101
Source: The Medical Card Register 2011-2017					

Table A6.7: Belfast Local Housing Market Areas Flows (%)

Belfast Local HMA containment persons aged 25-64					
	Current Belfast Sub HMA 2018 (June)				
Previous Belfast Sub HMA 2018	BMHMA-Central	BMHMA-Antrim	BMHMA-Ards and Down	N/A	Total
BMHMA-Central	86.3	13.4	16.5	3.8	33.1
BMHMA-Antrim	3.5	79.8	1.3	1.4	10.3
BMHMA-Ards and Down	4.3	1.0	77.6	0.9	9.2
Outside Belfast HMA	5.9	5.8	4.6	94.0	47.4
Total	100	100	100	100	100
Source: The Medical Card Register 2011-2017					

Table A6.8: Belfast Local Housing Market Areas submarket Flows (N)

Local Belfast Submarket containment persons aged 25-64								
	Current Belfast Local Sub HMA 2018 (June)							
Previous Belfast Local Sub HMA 2018	**Central**	**Lisburn**	**East Antrim**	**South Antrim**	**Ards**	**Down**	**Outside Belfast HMA**	**Total**
Central	128,459	5,350	6,001	1,167	5,683	2,100	7,040	155,800
Lisburn	3,165	17,444	316	159	316	321	2,713	24,434
East Antrim	4,529	451	34,297	910	464	110	1,871	42,632
South Antrim	1,040	216	841	9,583	80	26	1,674	13,460
Ards	5,163	305	378	86	27,306	240	782	34,260
Down	1,789	404	99	34	212	11,895	1,473	15,906
Outside Belfast HMA	7,736	2,858	1,743	1,578	875	1,460	242,359	258,609
Total	151,881	27,028	43,675	13,517	34,936	16,152	257,912	545,101

Table A6.9: Belfast Local Housing Market Areas submarket Flows (%)

Local Belfast Submarket containment persons aged 25-64								
	Current Belfast Local Sub HMA 2018 (June)							
Previous Belfast Local Sub HMA 2018	**Central**	**Lisburn**	**East Antrim**	**South Antrim**	**Ards**	**Down**	**Outside Belfast HMA**	**Total**
Central	84.6	19.8	13.7	8.6	16.3	13.0	2.7	28.6
Lisburn	2.1	64.5	0.7	1.2	0.9	2.0	1.1	4.5
East Antrim	3.0	1.7	78.5	6.7	1.3	0.7	0.7	7.8
South Antrim	0.7	0.8	1.9	70.9	0.2	0.2	0.6	2.5
Ards	3.4	1.1	0.9	0.6	78.2	1.5	0.3	6.3
Down	1.2	1.5	0.2	0.3	0.6	73.6	0.6	2.9
Outside Belfast HMA	5.1	10.6	4.0	11.7	2.5	9.0	94.0	47.4
Total	100	100	100	100	100	100	100	100