

# Northeast Avalon Project Update

Harris Centre for Regional Analytics (RAnLab)  
Memorial University

Alvin Simms, PhD and Jamie Ward, MSc  
Harris Centre RAnLab, Memorial University



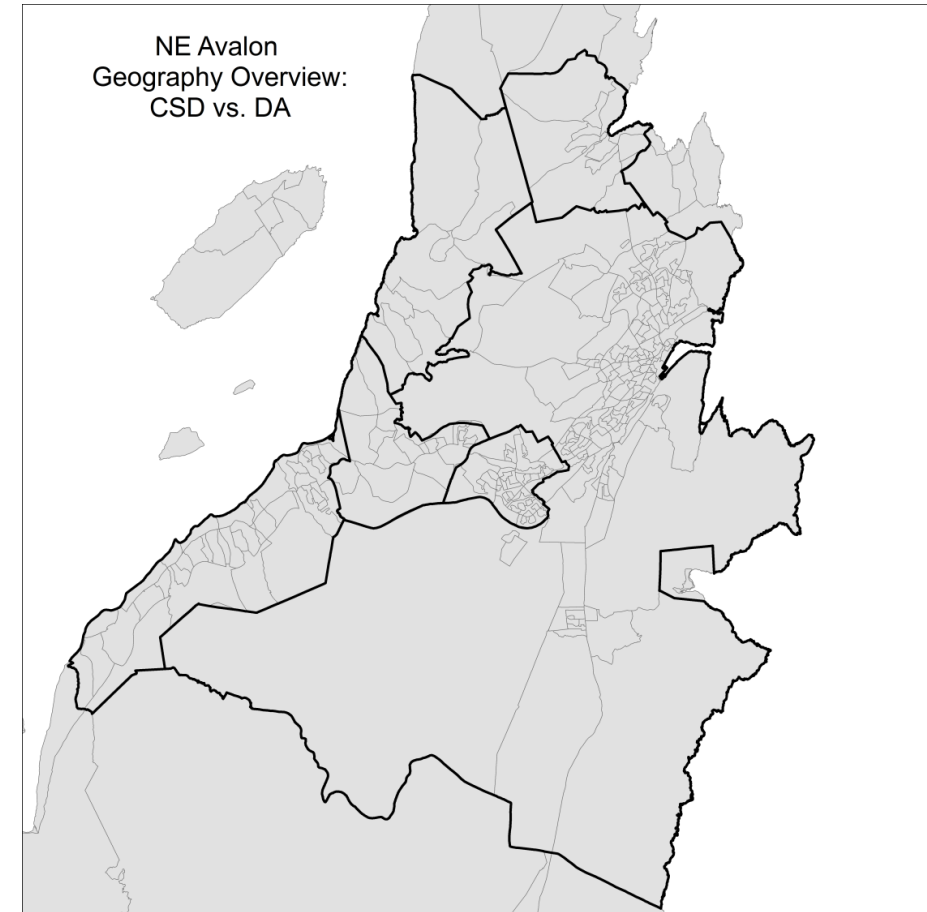
- Understand the implications of changing demographics and associated trends
  - Municipal services/planning
  - Economic development
  - Other stakeholders



- Completed:
  - Data preparation
  - Model Construction
    - Population (Cohort Survival) Model
    - Supply Chain Model
- In Progress:
  - Data connections
  - Scenario application



- Census data available in a number of different of configurations
- Census Sub-Divisions (CSDs) vs. Dissemination Areas (DAs)
- Vital Statistics = Local Areas





Trade-off:

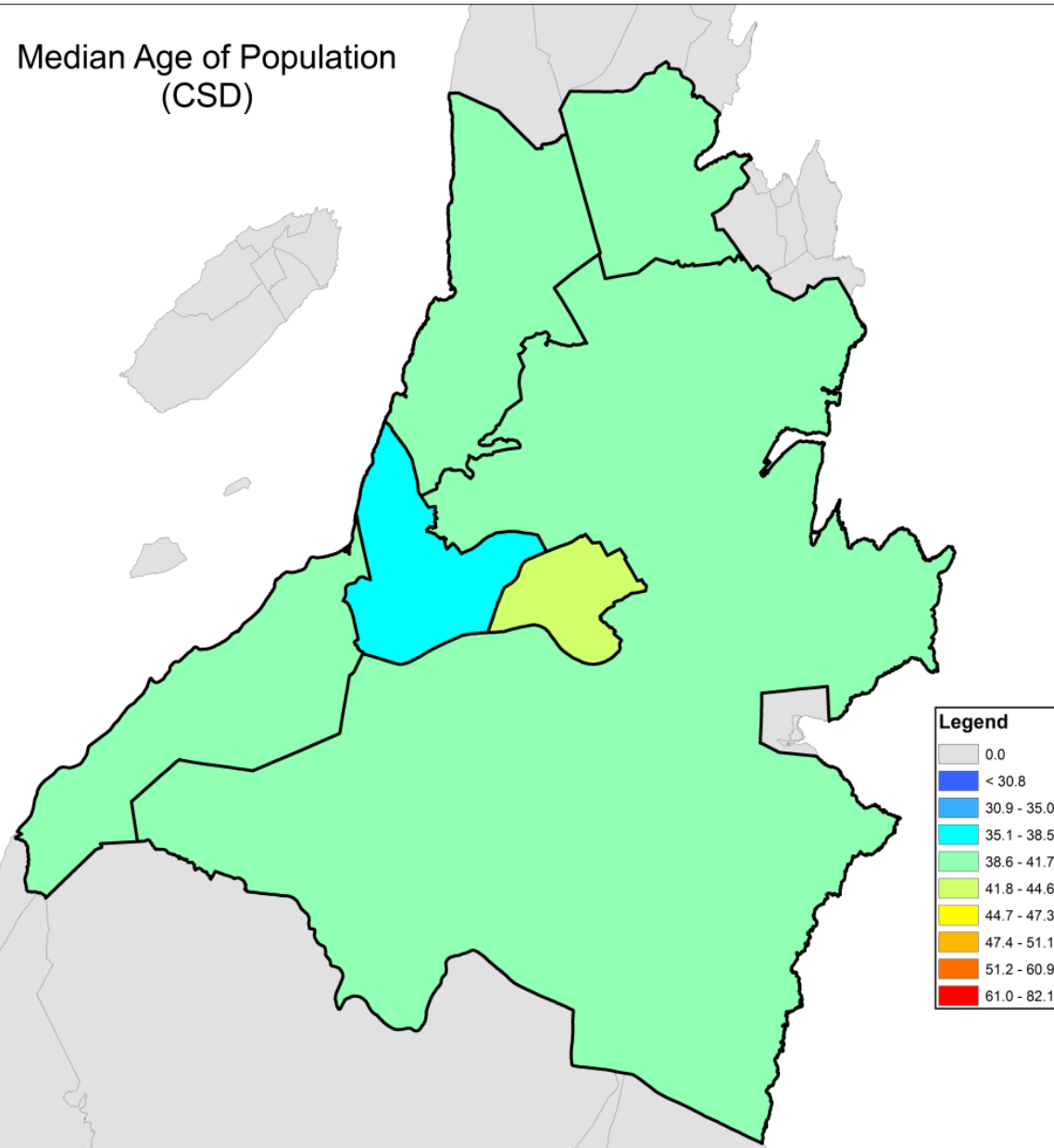
DAs have detail, but must watch suppression

CSD Name	CSD Count	Population, 2016	Land area in square kilometres
Conception Bay South	1	26,199	59.1
Mount Pearl	1	22,957	15.76
Paradise	1	21,389	29.58
Portugal Cove-St. Philip's	1	8,147	57.43
St. John's	1	108,860	445.88
Torbay	1	7,899	34.89

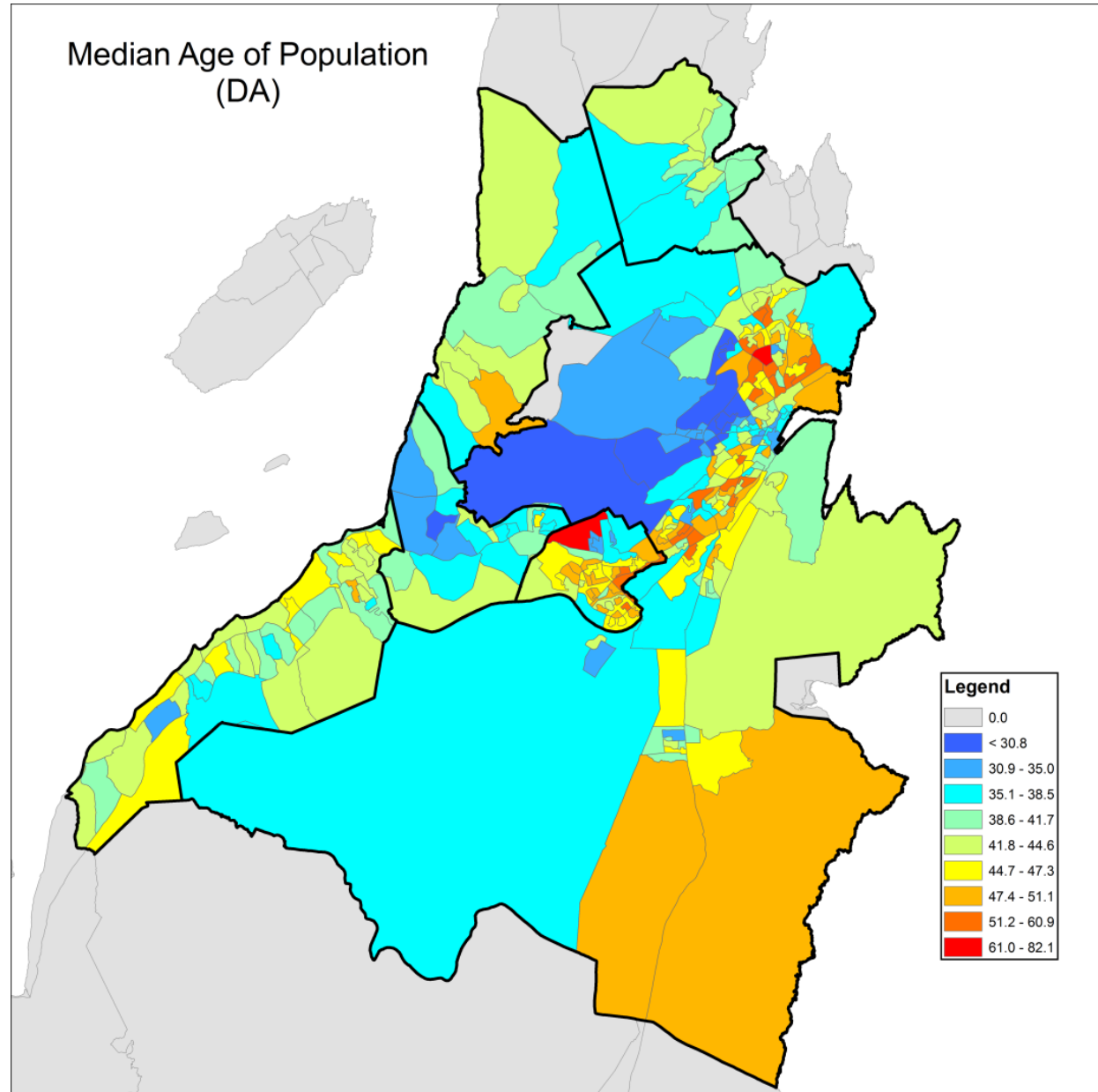
CSD Name	DA Count	Mean population, 2016	Mean land area in square kilometres
Conception Bay South	39	672	1.52
Mount Pearl	44	522	0.36
Paradise	21	1,019	1.41
Portugal Cove-St. Philip's	10	815	5.74
St. John's	185	588	2.41
Torbay	11	718	3.17



Median Age of Population  
(CSD)



Median Age of Population  
(DA)



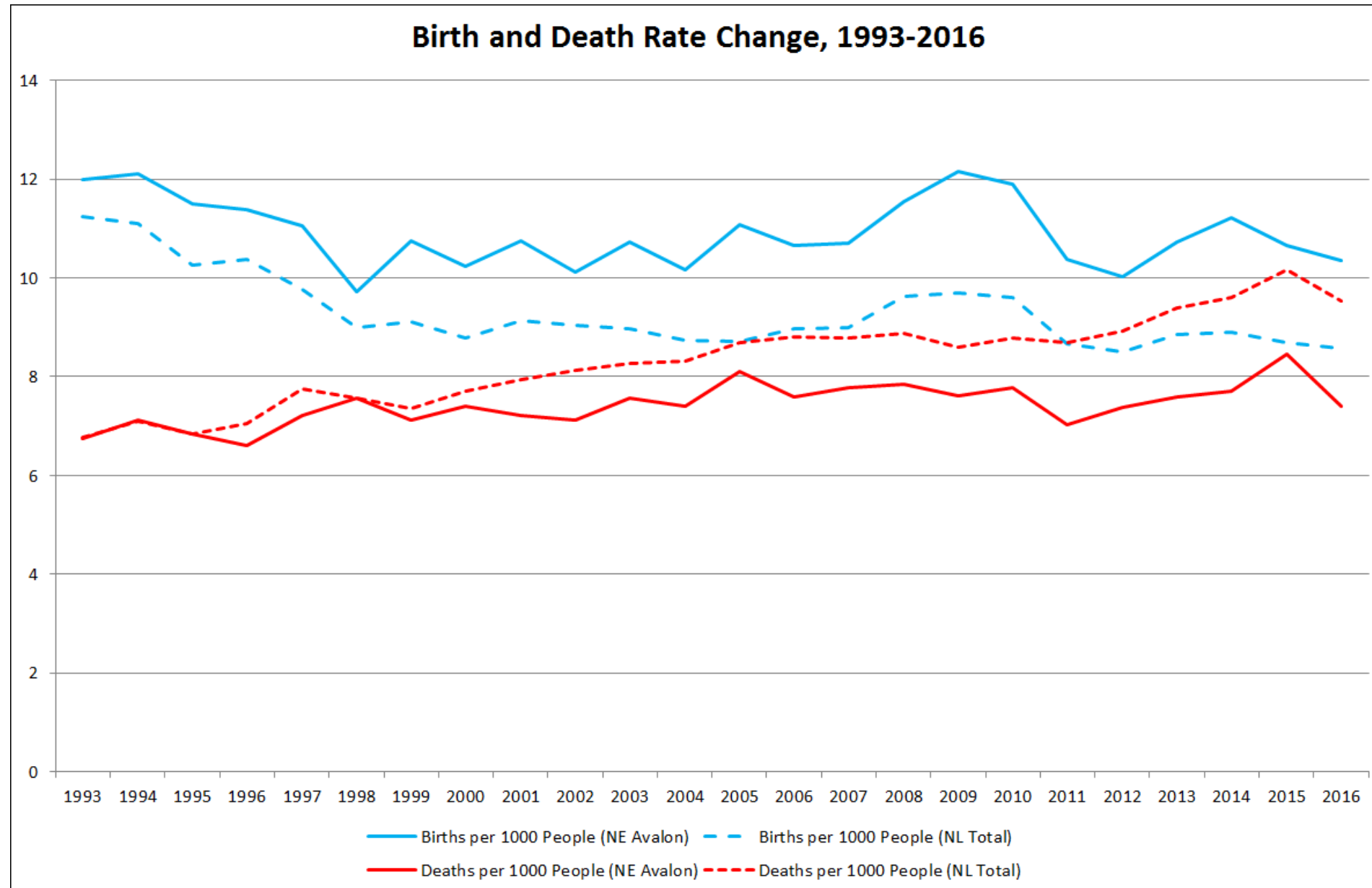


- 2016 Census
  - Demographics (single year population data, migration)
  - Labour force (education, utilization, occupations, income)
  - Housing (structure type, affordability, suitability, condition)
- NE Avalon Citizen survey
  - Service preferences
  - Income groups
  - Limiting categories
- Other sources
  - NL Government Volunteer Census
  - NL Community Accounts Vital Statistics (Births, Deaths)



- For NL overall:
  - Below-replacement birth rates plus net out-migration = Ageing population
- Potential demographic shifts may affect the Northeast Avalon very differently than other areas of the province
  - Intra-provincial migration historically positive
  - Birth rates still below replacement







- Estimate single-year age cohorts for 20 years (2016-2036)
  - Flexible geography
  - Customizable scenarios
- Use to estimate future:
  - Labour supply
  - Housing demand
  - Retail demand
  - Demand for municipal services

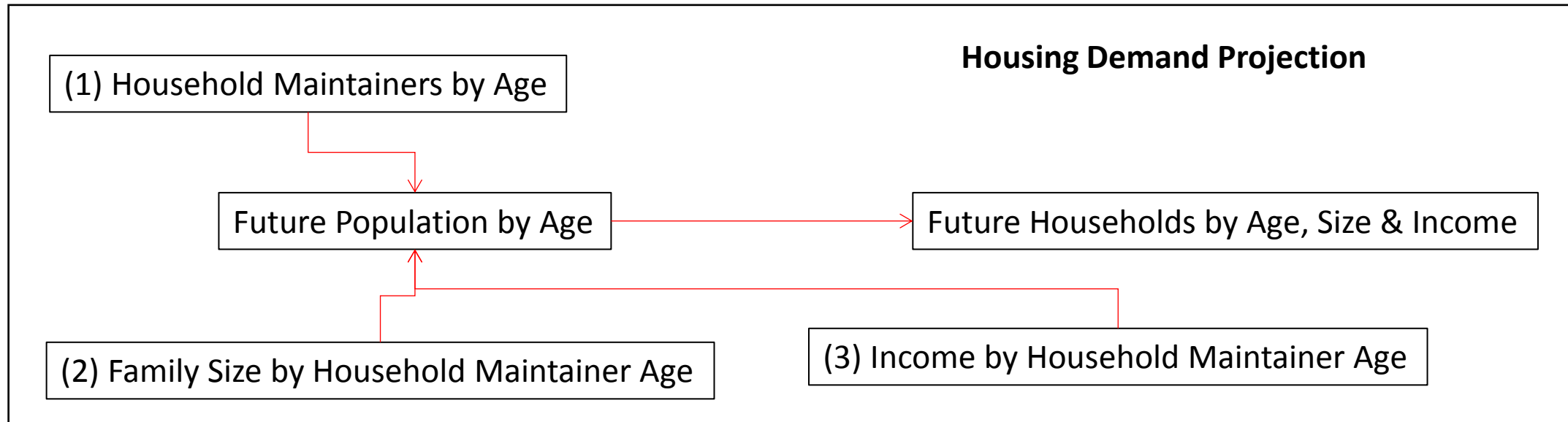
Cohort Survival Model					
Age Group	Base Year Population	Fertility Rate	Mortality Rate	Net Migration	Future Population
0-4	$P_0$	$FR_0$	$MR_0$	$NM_0$	
5-9	$P_1$	$FR_1$	$MR_1$	$NM_1$	$P_0FR_0MR_0+NM_0$
10-14	$P_2$	$FR_2$	$MR_2$	$NM_2$	$P_1FR_1MR_1+NM_1$
15-19	$P_3$	$FR_3$	$MR_3$	$NM_3$	$P_2FR_2MR_2+NM_2$
...	...	...	...	...	...
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80-84	$P_{16}$	$FR_{16}$	$MR_{16}$	$NM_{16}$	$P_{15}FR_{15}MR_{15}+NM_{15}$
85+	$P_{17}$	$FR_{17}$	$MR_{17}$	$NM_{17}$	$P_{16}FR_{16}MR_{16}+NM_{16}$



- Future labour supply, and housing, retail and municipal demands forecast by converting population by single age cohort
  - Relationships derived from 2016 census datasets
- Labour supply = Population by education field + skill level
- Housing demand = Families by size + income + primary household maintainer age
- Retail demand/spending = Population by age + income
- Municipal service demand = Population by age (initially)

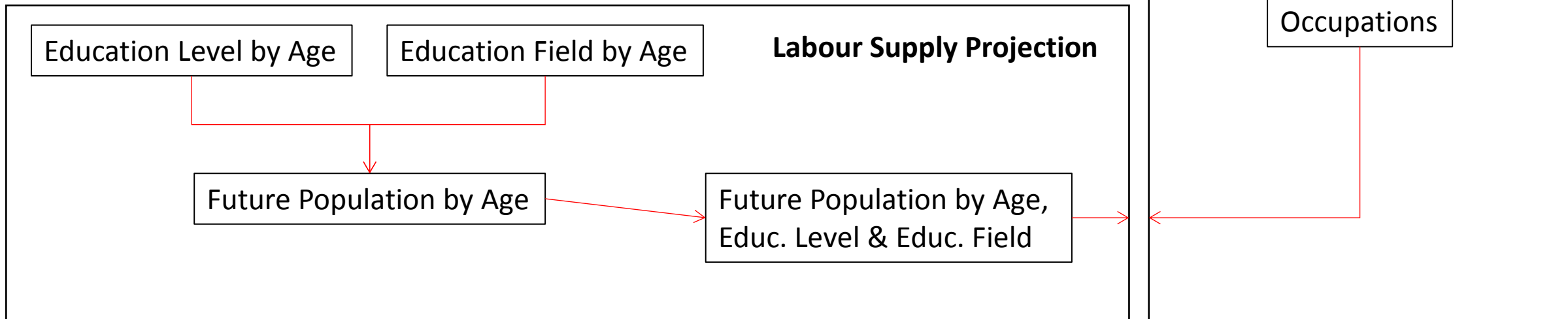


- Families (housing demand) exhibit changing needs and tastes as they age
- How prepared is the housing supply for anticipated challenges?
  - Supply = scenarios





- Industries have different labour requirements due to occupations ageing at different rates
- Which labour market supply groups (education level/field) will require the most regeneration?
  - Potential for migration or volunteers?
- Demand (from industries) = scenarios
- Impacts = Ripple through supply chain model





Occupation	Skill Level	Total Employment	Mean Age	Percent >= 55 years old
Retail salespersons	C	4705	34.7	15.7%
Registered nurses and registered psychiatric nurses	A	2835	42.4	13.2%
Cashiers	D	2495	28.3	8.4%
Retail and wholesale trade managers	O	2485	44.8	22.2%
Food counter attendants, kitchen helpers and related support occupations	D	2350	30.5	11.3%
General office support workers	C	1950	43.6	22.6%
Administrative officers	B	1740	45.4	20.7%
Elementary school and kindergarten teachers	A	1690	40.0	7.7%
Financial auditors and accountants	A	1485	42.4	17.9%
Home support workers, housekeepers and related occupations	C	1440	44.5	31.1%
Administrative assistants	B	1420	45.7	22.7%
Cooks	B	1375	34.3	12.7%
Janitors, caretakers and building superintendents	D	1370	46.7	32.0%
Light duty cleaners	D	1355	44.3	25.3%
Food and beverage servers	C	1275	27.9	3.5%
Carpenters	B	1135	43.5	21.2%
Construction trades helpers and labourers	D	1120	40.8	19.5%
Nurse aides, orderlies and patient service associates	C	1105	39.5	16.3%
Other customer and information services representatives	C	1100	40.3	14.6%
University professors and lecturers	A	1090	49.7	34.7%



## Oldest Occupations



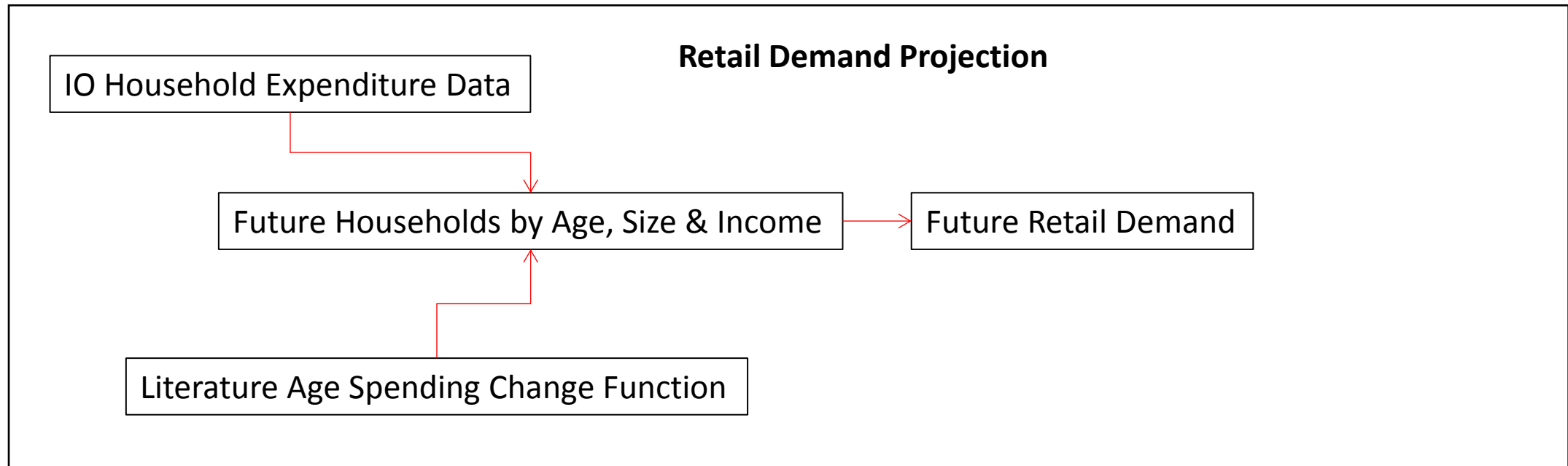
Occupation	Skill Level	Total Employment	Mean Age	Percent >= 55 years old
Professional occupations in religion	A	120	53.2	45.8%
Taxi and limousine drivers and chauffeurs	C	285	53.0	54.2%
Bus drivers, subway operators and other transit operators	C	260	52.2	50.0%
Senior government managers and officials	O	190	52.1	30.8%
Senior managers - construction, transportation, production and utilities	O	245	52.0	39.6%
Senior managers - health, education, social and community services and membership organizations	O	250	51.7	30.2%
Managers in natural resources production and fishing	O	160	50.5	35.5%
University professors and lecturers	A	1090	49.7	34.7%
Senior managers - financial, communications and other business services	O	290	49.2	36.2%
Nursing co-ordinators and supervisors	A	135	49.1	32.0%
Other business services managers	O	125	48.9	26.9%
Drafting technologists and technicians	B	185	48.9	32.4%
Managers in agriculture	O	115	48.8	39.1%
Survey interviewers and statistical clerks	C	140	48.5	34.6%
Senior managers - trade, broadcasting and other services, n.e.c.	O	195	48.5	34.1%
Accommodation service managers	O	100	48.4	40.9%
Managers in health care	O	240	48.3	27.7%
Real estate agents and salespersons	B	445	48.3	34.8%
Couriers, messengers and door-to-door distributors	C	155	48.2	36.7%
Authors and writers	A	110	48.1	34.8%

Occupation	Skill Level	Total Employment	Mean Age	Percent >= 55 years old
Maîtres d'hôtel and hosts/hostesses	C	150	22.2	0.0%
Program leaders and instructors in recreation, sport and fitness	B	895	25.3	4.5%
Food and beverage servers	C	1275	27.9	3.5%
Cashiers	D	2495	28.3	8.4%
Specialized cleaners	D	235	29.8	8.3%
Animal health technologists and veterinary technicians	B	105	30.5	0.0%
Food counter attendants, kitchen helpers and related support occupations	D	2350	30.5	11.3%
Industrial engineering and manufacturing technologists and technicians	B	115	31.2	0.0%
Paramedical occupations	B	175	31.4	0.0%
Estheticians, electrologists and related occupations	C	285	31.7	3.6%
Post-secondary teaching and research assistants	A	675	31.8	5.2%
Operators and attendants in amusement, recreation and sport	D	210	31.9	11.1%
Heating, refrigeration and air conditioning mechanics	B	125	32.1	0.0%
Bartenders	C	350	32.1	7.2%
Non-commissioned ranks of the Canadian Armed Forces	B	245	32.4	4.1%
Pet groomers and animal care workers	C	130	32.7	7.7%
Other automotive mechanical installers and servicers	C	115	33.5	8.0%
Dental assistants	C	150	33.8	0.0%
Store shelf stockers, clerks and order fillers	D	1035	34.1	13.5%
Cooks	B	1375	34.3	12.7%

Youngest Occupations



- We have detailed (N=100 categories) household expenditure data
- Income and spending habits vary significantly with age
- Supply (retail locations) = Business register + scenarios
- Impacts = Ripple through supply chain model





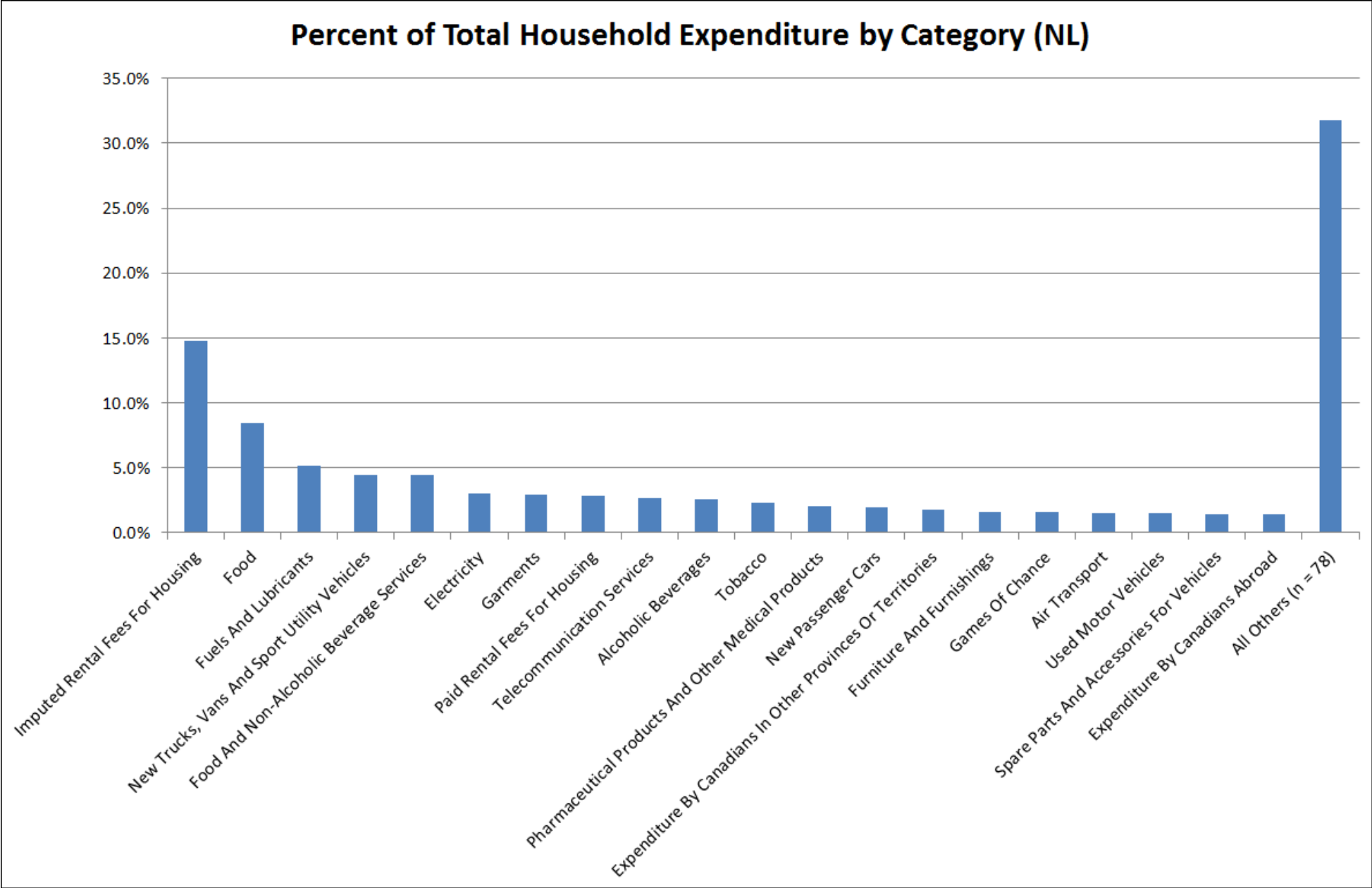




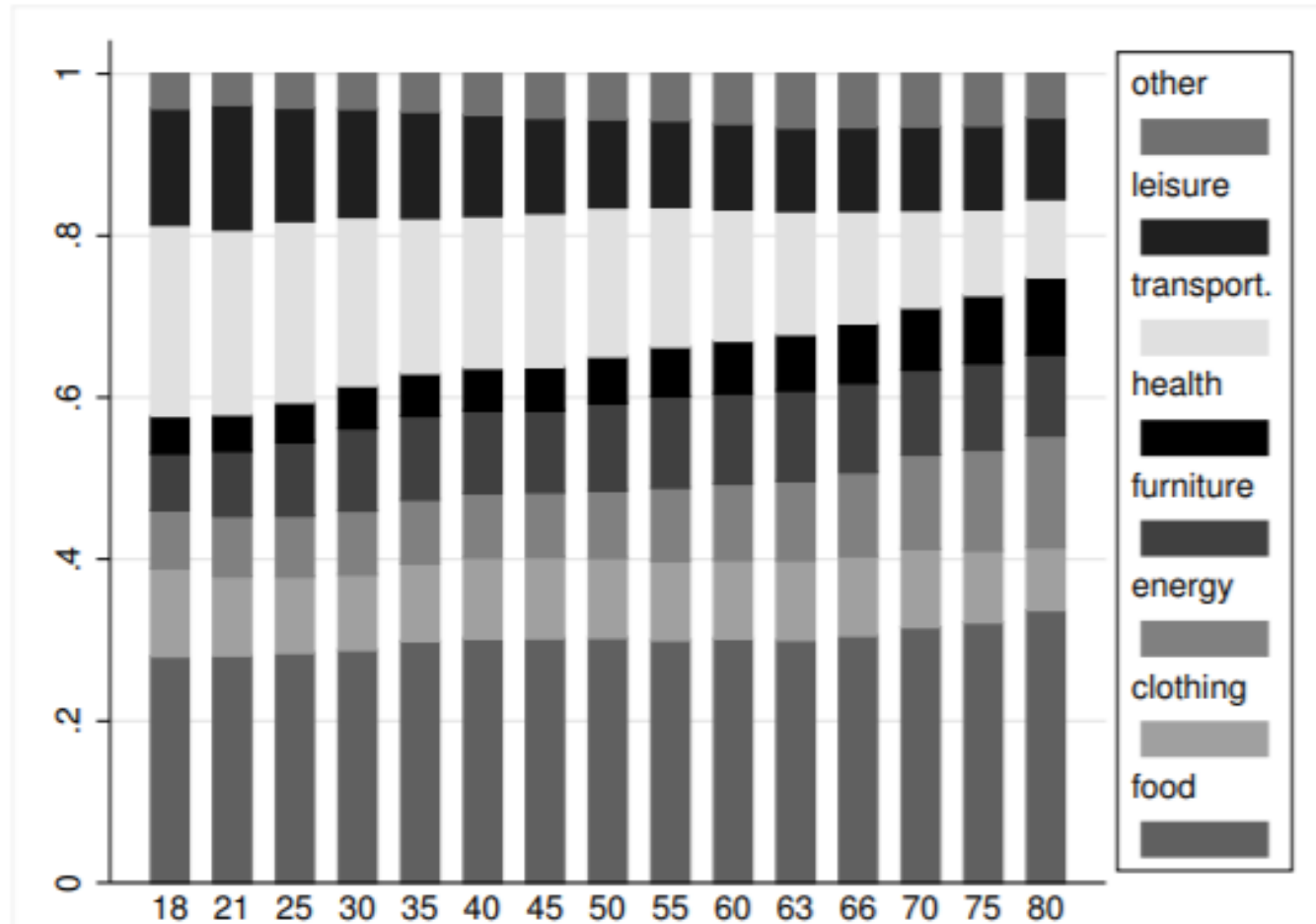
Tableau A-1: Consumption by age compared to the 40-44 years

	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84
Total consumption	1.07	1.08	1.04	1	1.09	1.17	1.18	1.23	1.22	1.24	1.16	1.10
Private transport	1.91	1.43	1.26	1	0.94	1.01	1.01	0.86	0.79	0.80	0.71	0.39
Public transport	0.73	0.78	0.72	1	0.967	1.11	0.85	0.80	0.58	0.59	0.45	0.46
Food	1.08	1.02	1.05	1	1.11	1.07	1.08	1.03	1.05	1.01	0.89	0.79
Clothes	1.23	1.23	1.05	1	0.89	0.81	0.62	0.64	0.49	0.41	0.32	0.24
Equipment	1.24	1.42	1.08	1	0.73	0.50	0.35	0.28	0.19	0.15	0.16	0.17
Housing	0.79	0.83	0.91	1	1.01	1.03	1.01	1.01	1.03	1.10	1.012	1.11
Charges	0.87	1.07	0.81	1	1.01	1.02	1.18	1.47	1.56	1.73	1.47	1.44
Energy	0.88	0.91	0.95	1	1.06	1.09	1.18	1.27	1.44	1.39	1.41	1.38
Health	0.72	0.89	0.86	1	1.08	1.26	1.36	1.55	1.68	1.52	1.67	1.47
Leisure	0.81	0.80	0.86	1	1.18	1.32	1.30	1.62	1.69	1.90	1.78	1.46

Source: Mathieu Lefebvre, 2006. "[Population ageing and consumption demand in Belgium](#)," [CREPP Working Papers](#) 0604, Centre de Recherche en Economie Publique et de la Population (CREPP) (Research Center on Public and Population Economics) HEC-Management School, University of Liège.



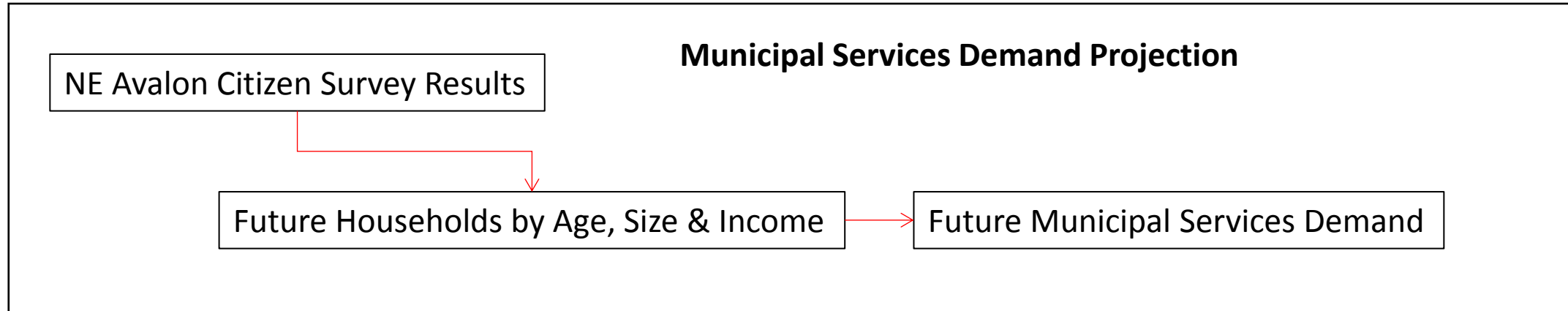
Figure 1: Mean expenditure shares by age, averaged over the sample years 1978-1998



Melanie Luhrmann, 2005. "[Population Aging and the Demand for Goods & Services](#)," [MEA discussion paper series](#) 05095, Munich Center for the Economics of Aging (MEA) at the Max Planck Institute for Social Law and Social Policy.



- Different age groups demand different types of services
- Proportion by age group varies greatly by neighbourhood
- Categories available in survey limits options
  - Parks/Playgrounds together





- An operational regional economic systems model that can assess the:
  - Connections,
  - Locational requirements, and
  - Impacts of any planned, present or projected changes in industries, labour markets, or services as well as the introduction or removal of industries or services from a region or community.
- Use to estimate:
  - Local multipliers
  - Retail (economic) supply



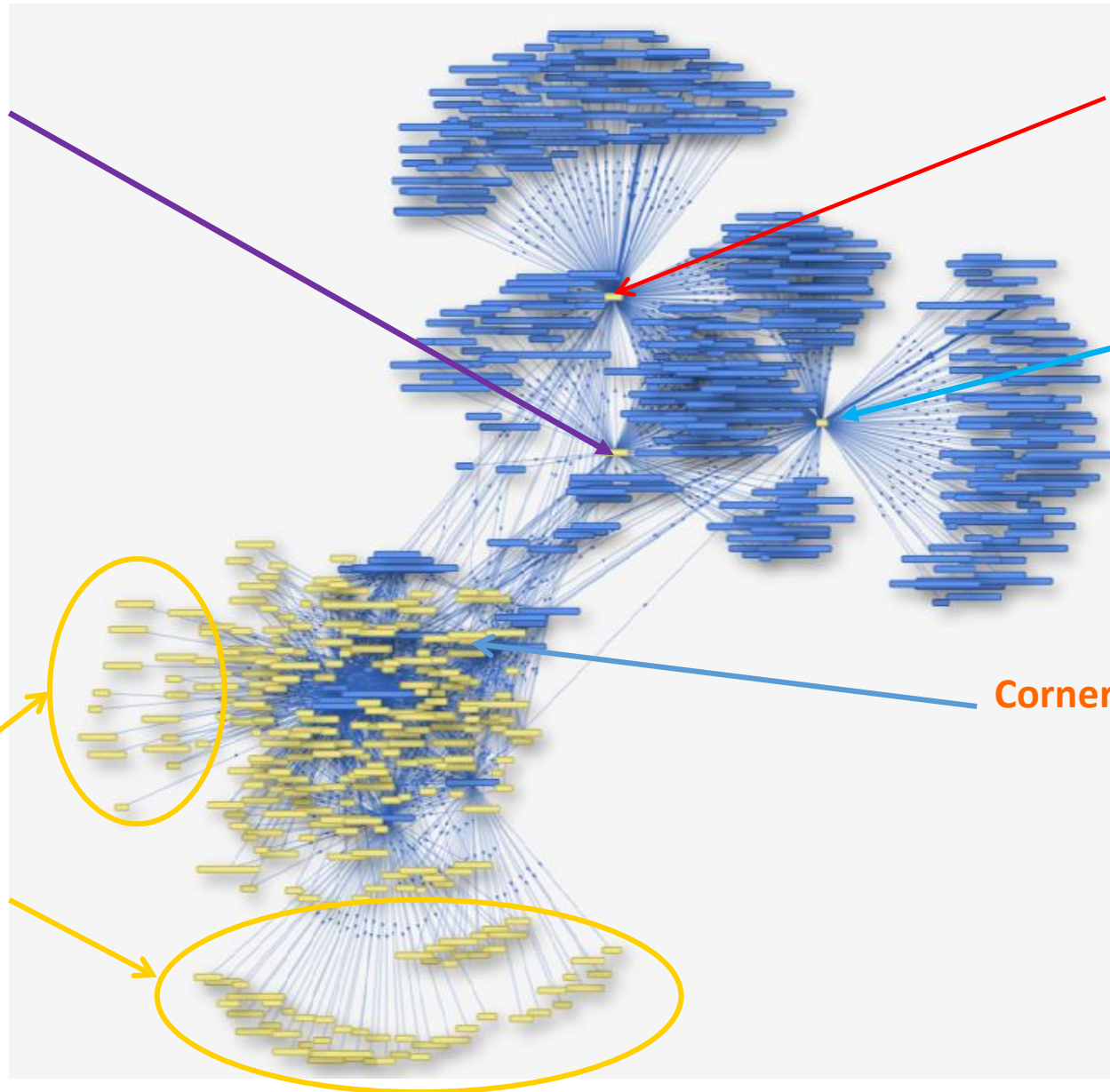
Commodities that  
can be purchased  
from any larger  
centre

St. John's

Trade  
(Imports &  
Exports)

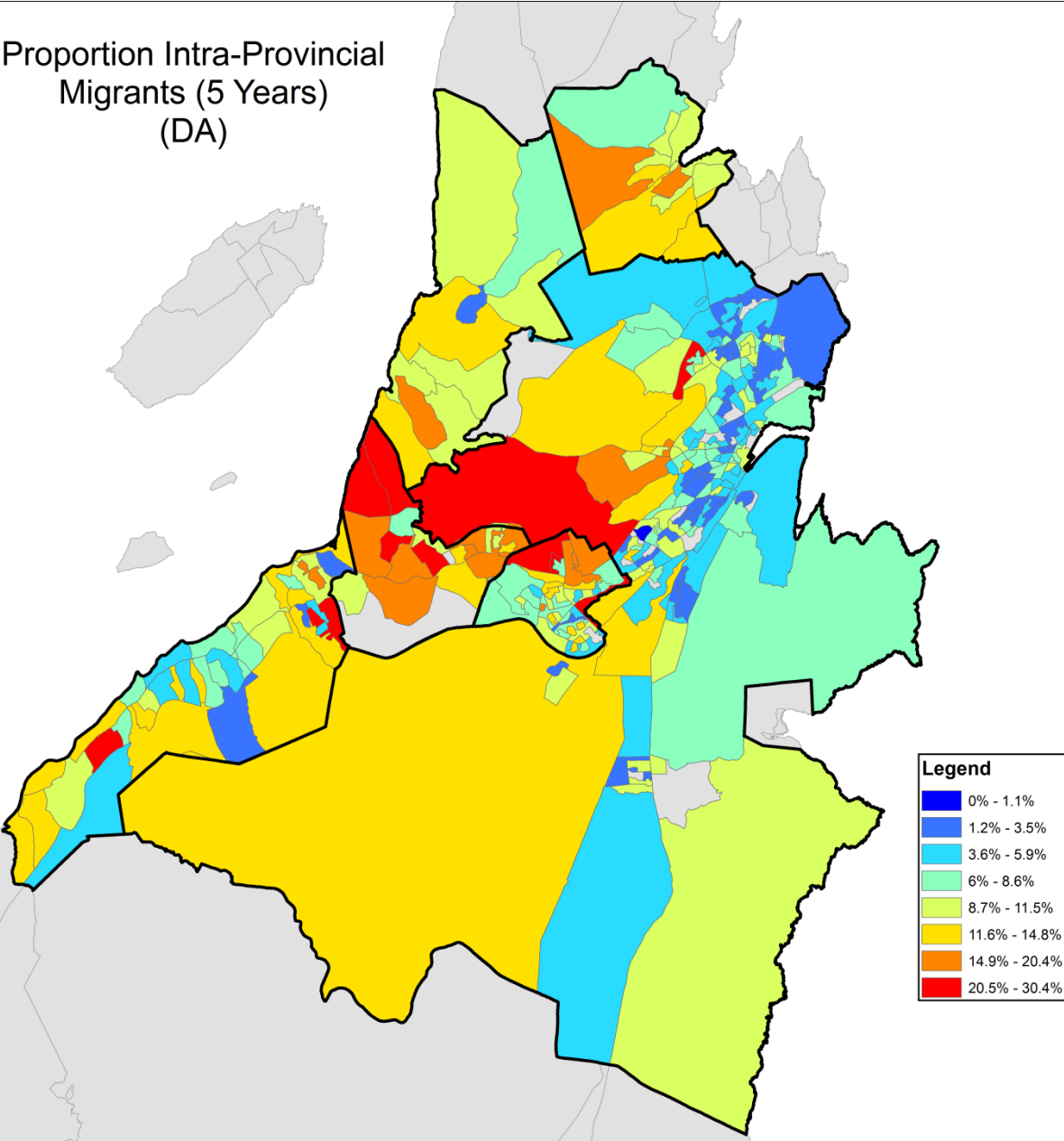
Corner Brook

Small Isolated  
communities  
weaker flows

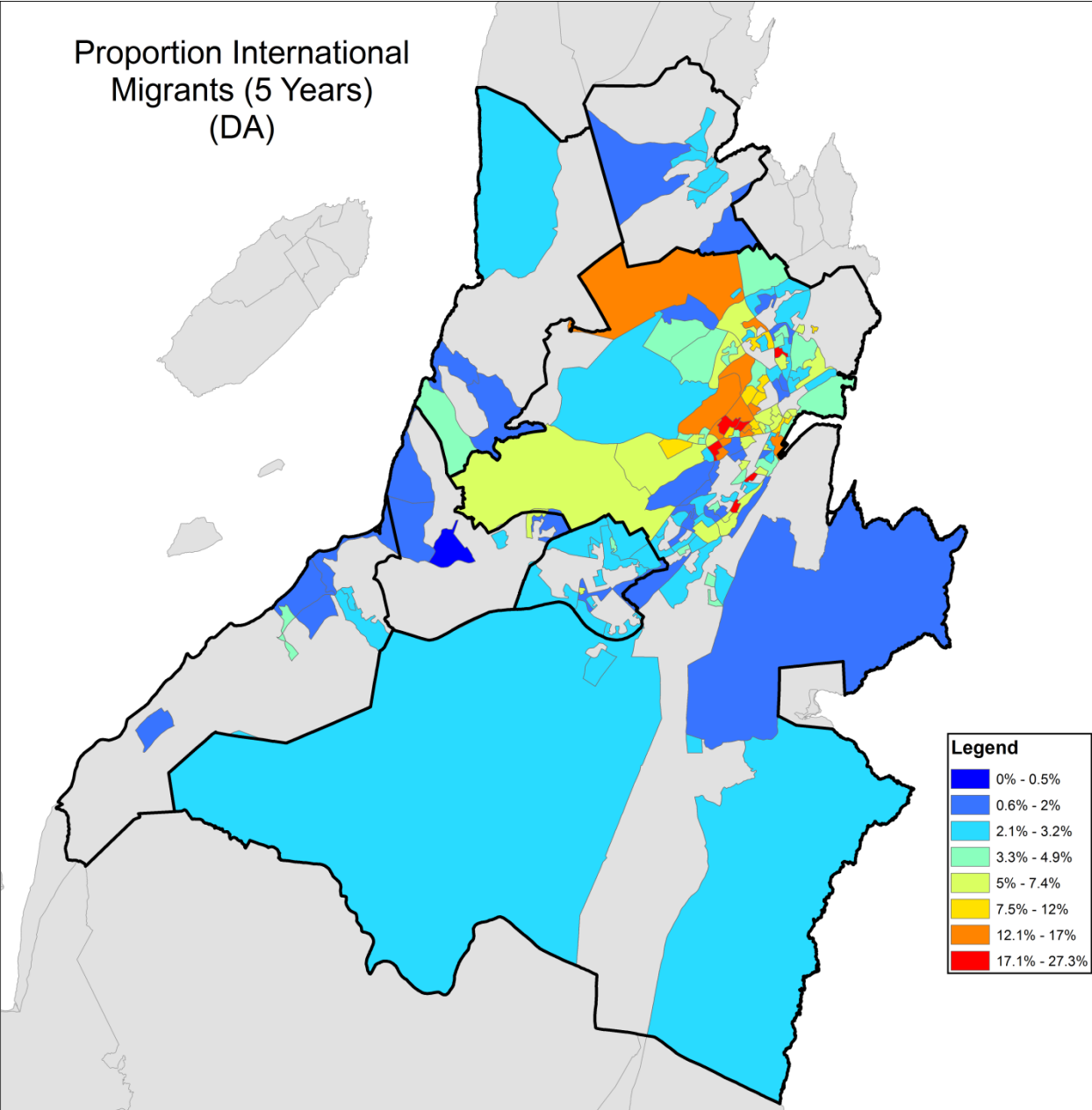


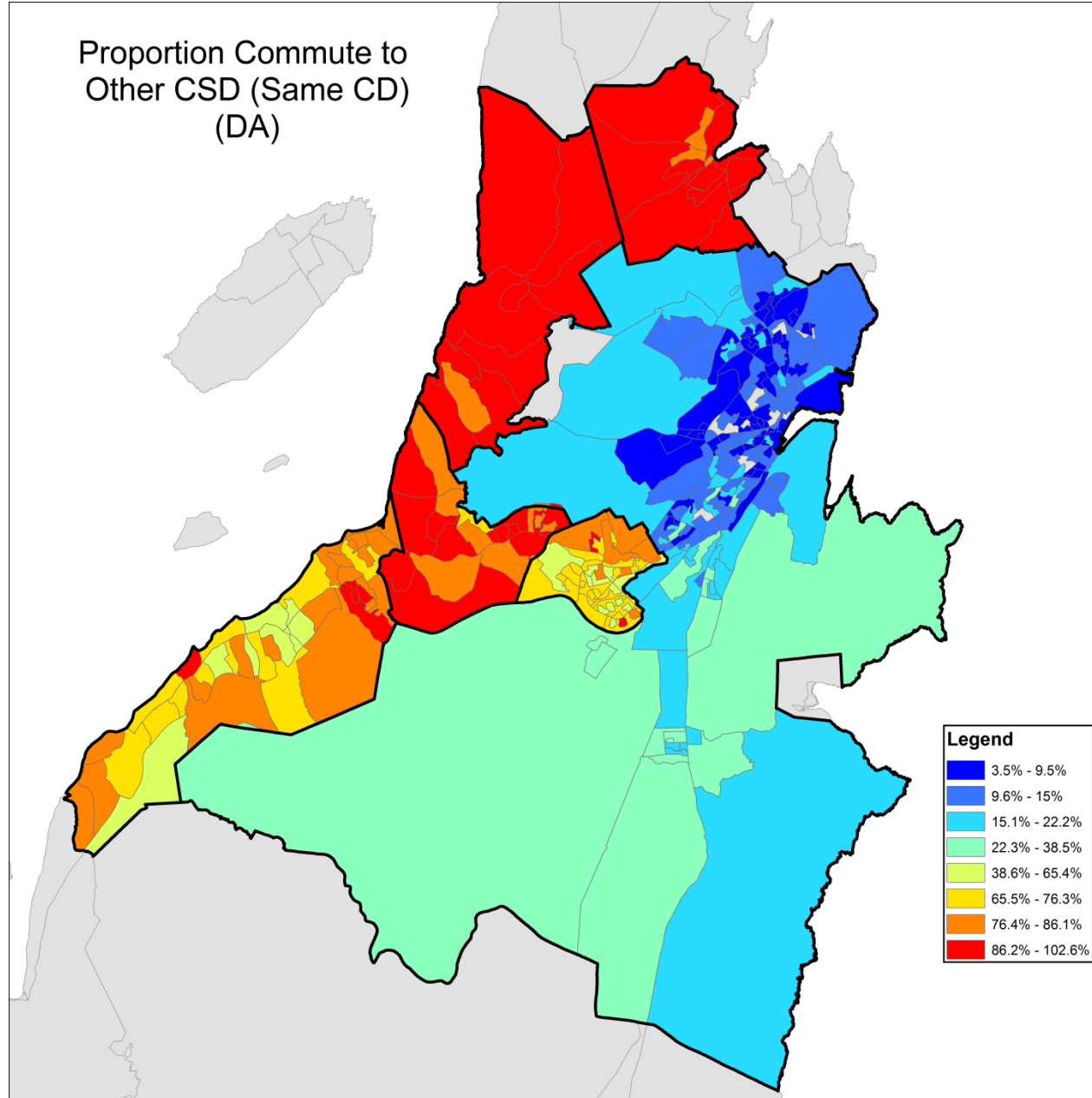


Proportion Intra-Provincial  
Migrants (5 Years)  
(DA)

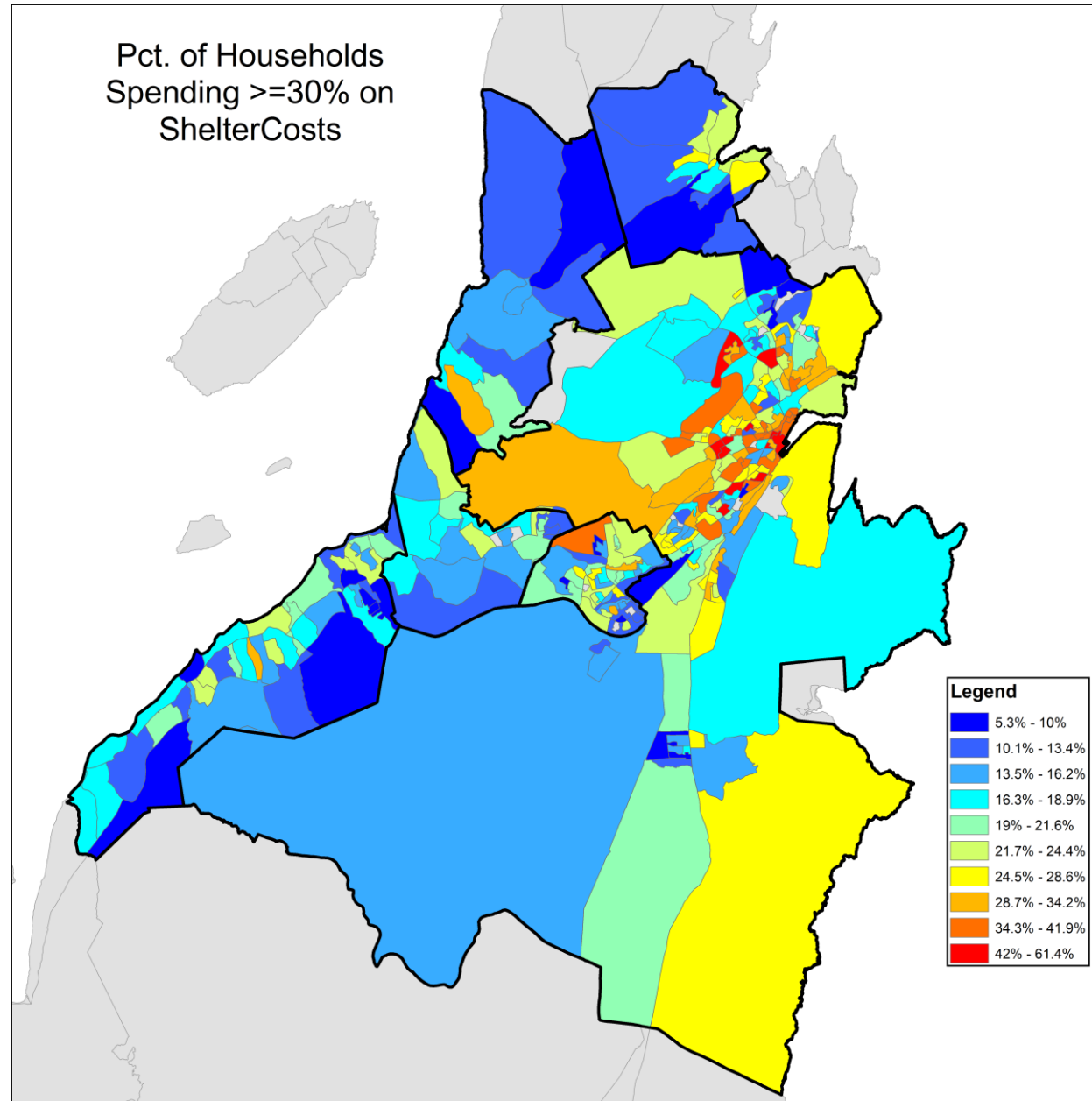


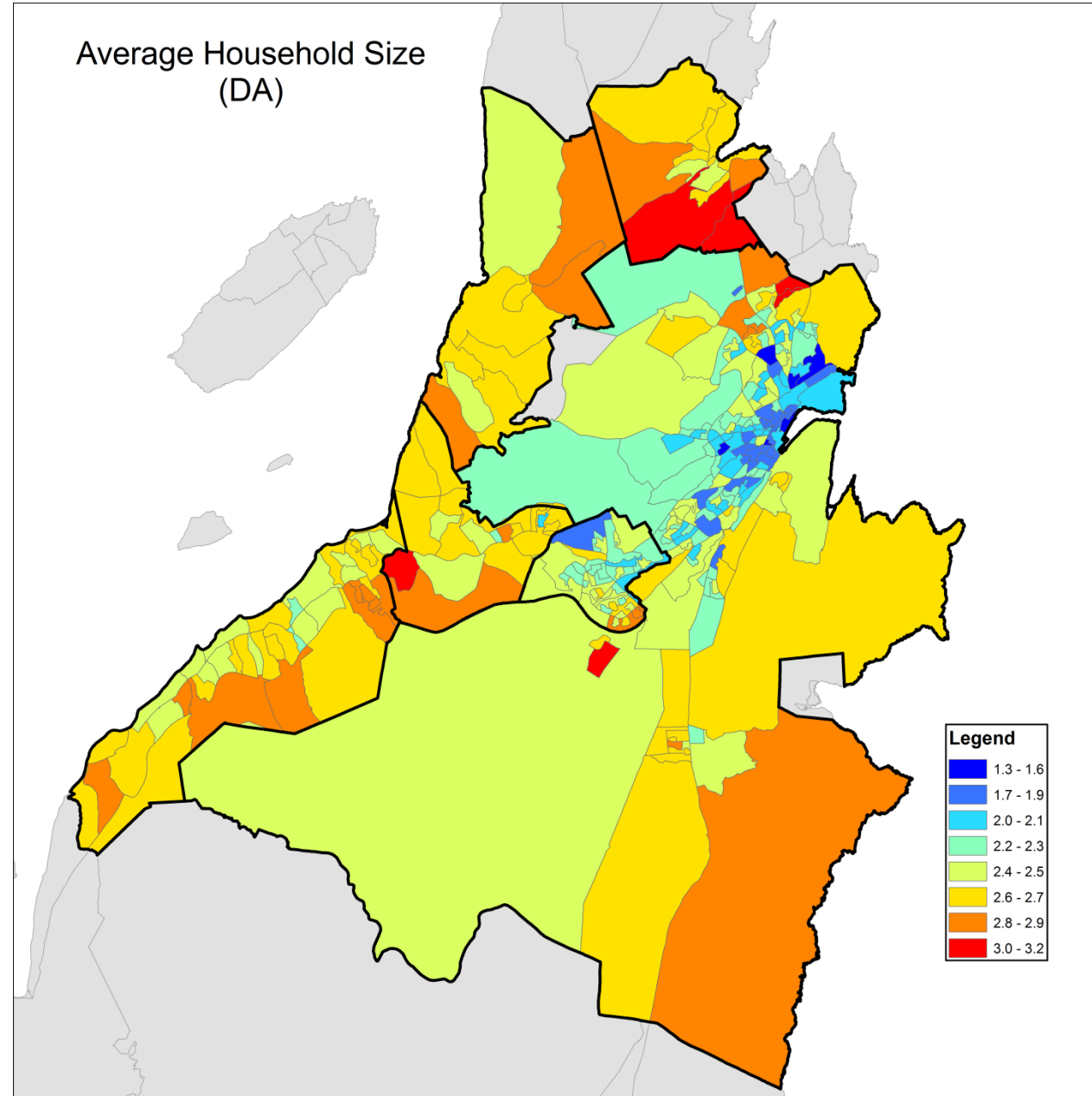
Proportion International  
Migrants (5 Years)  
(DA)

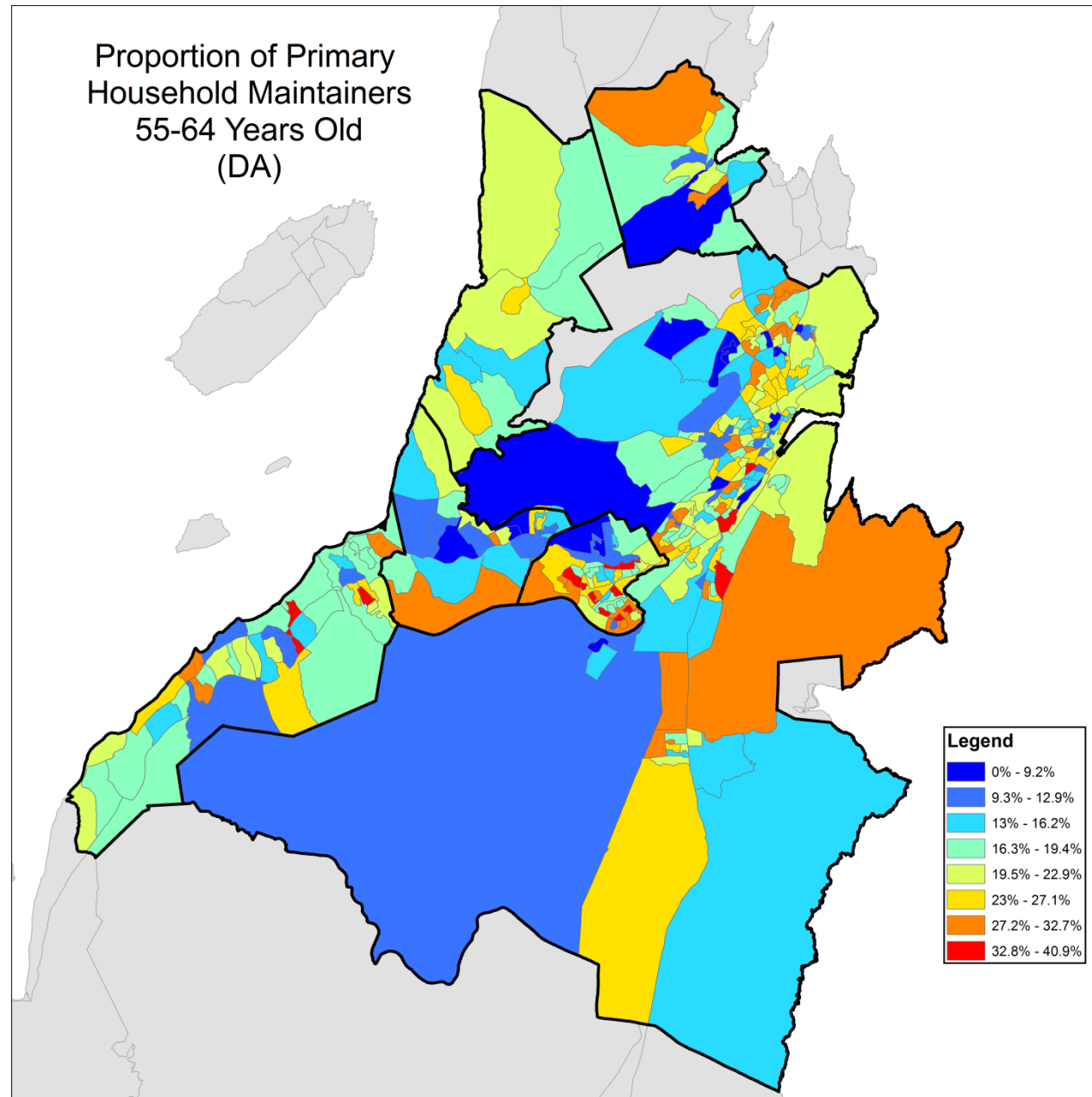


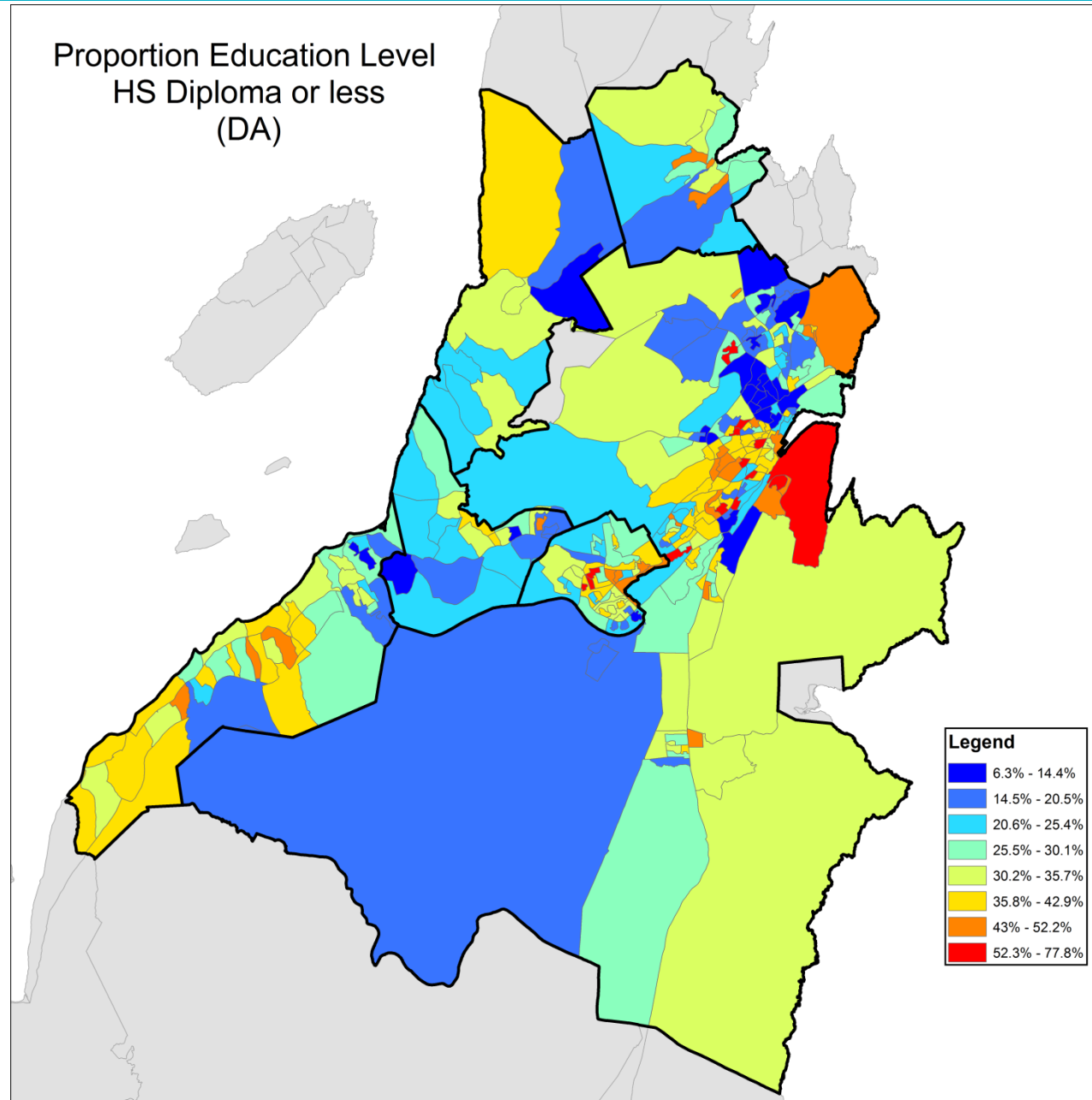


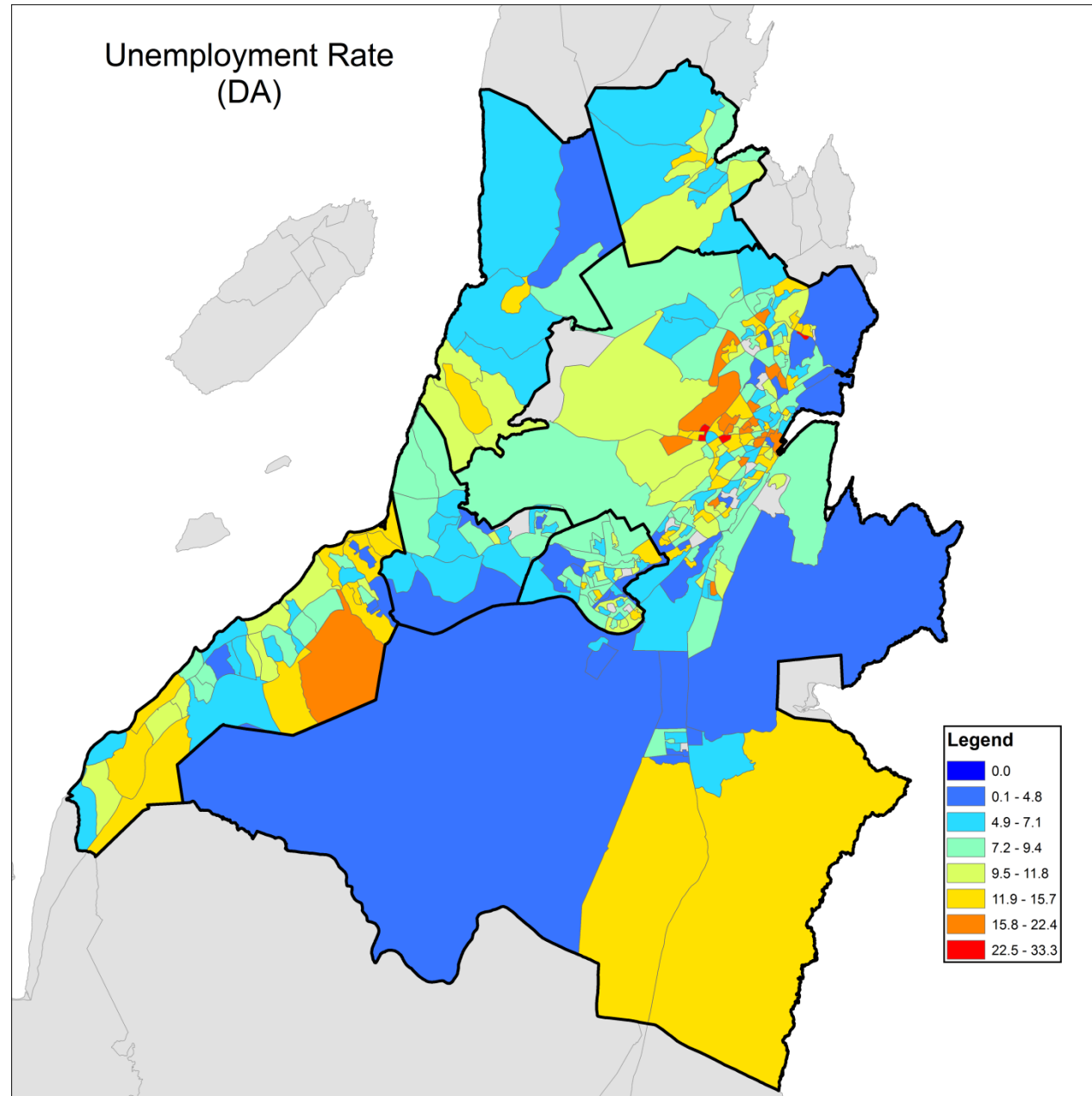


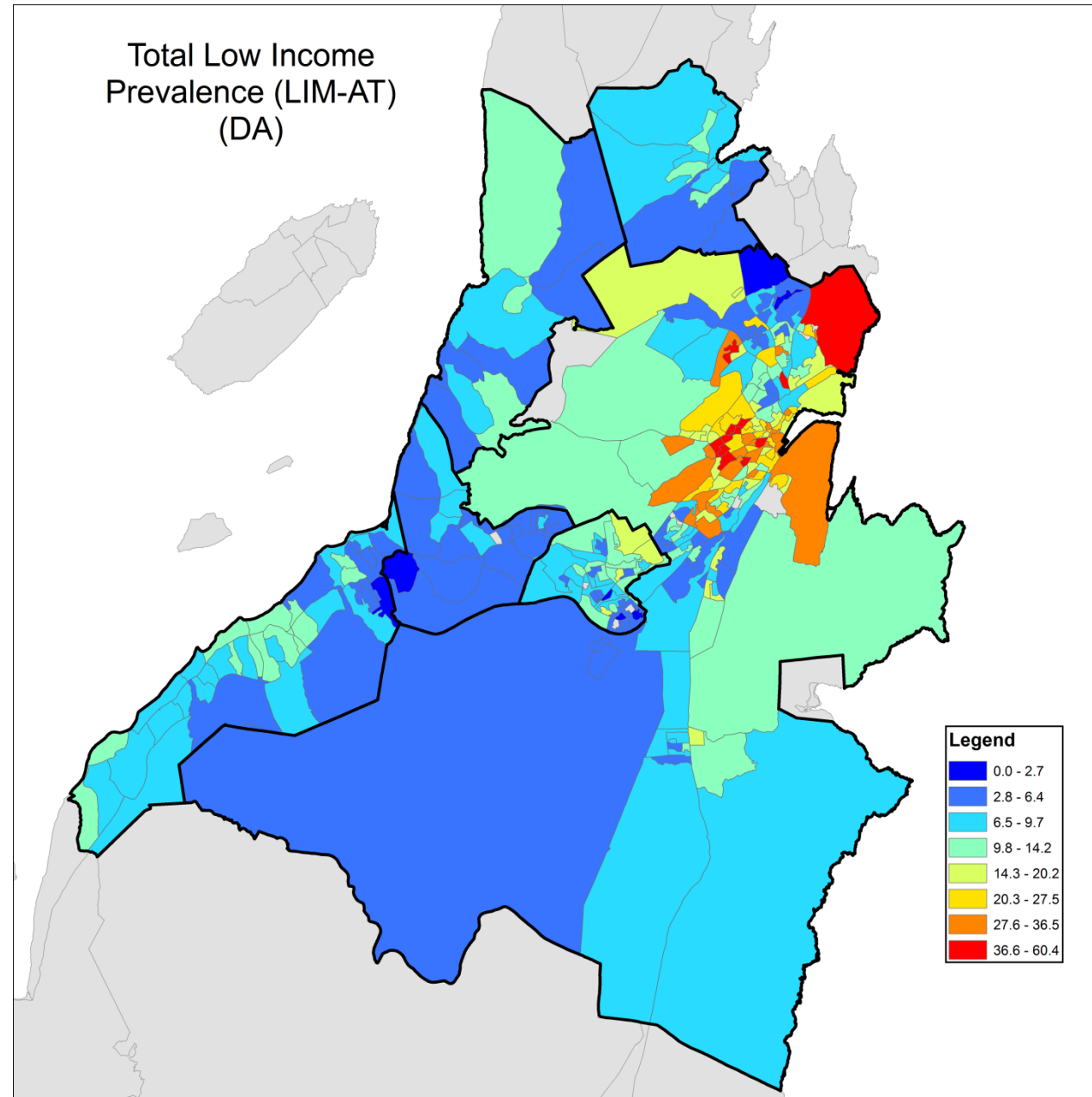






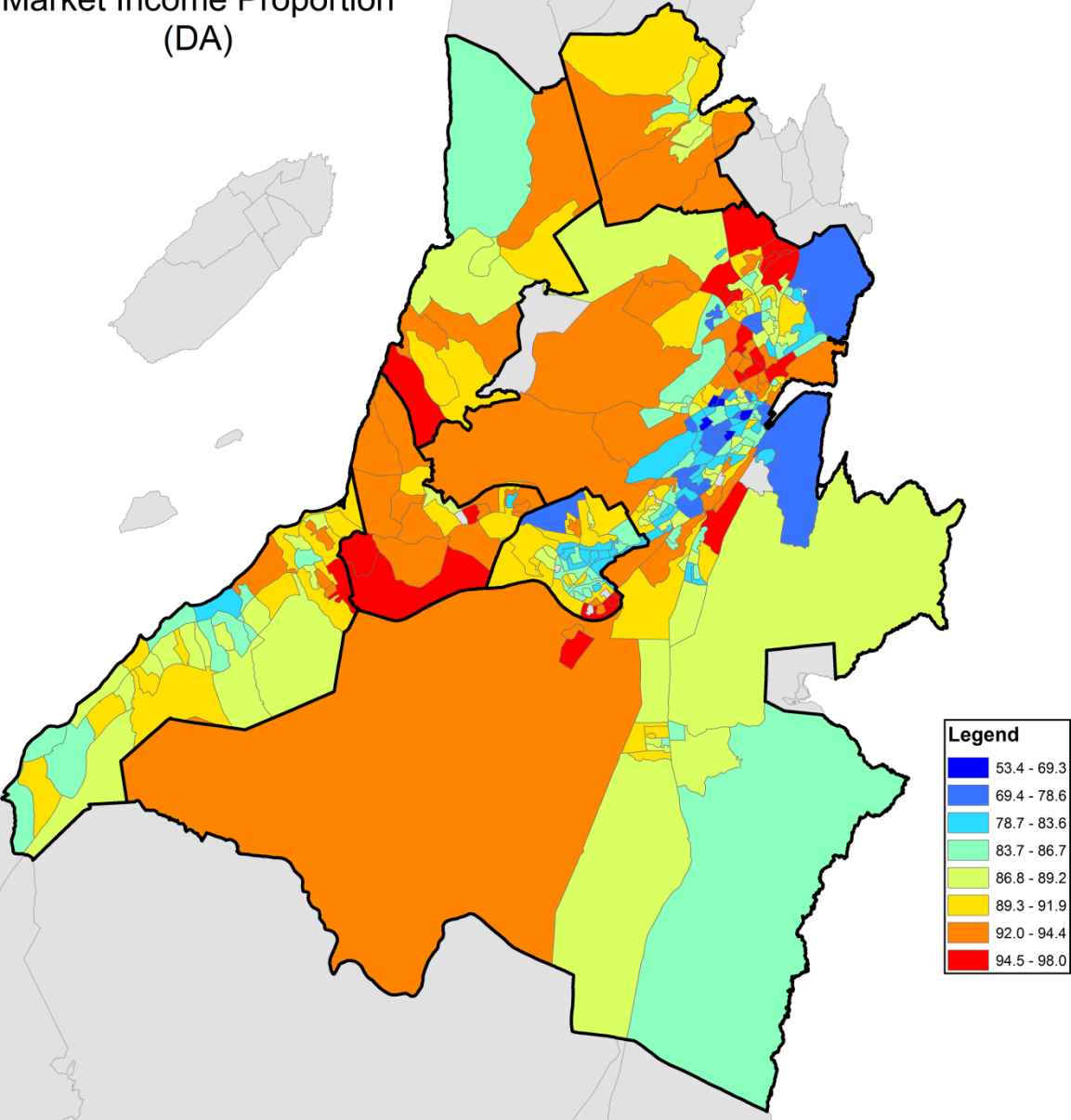




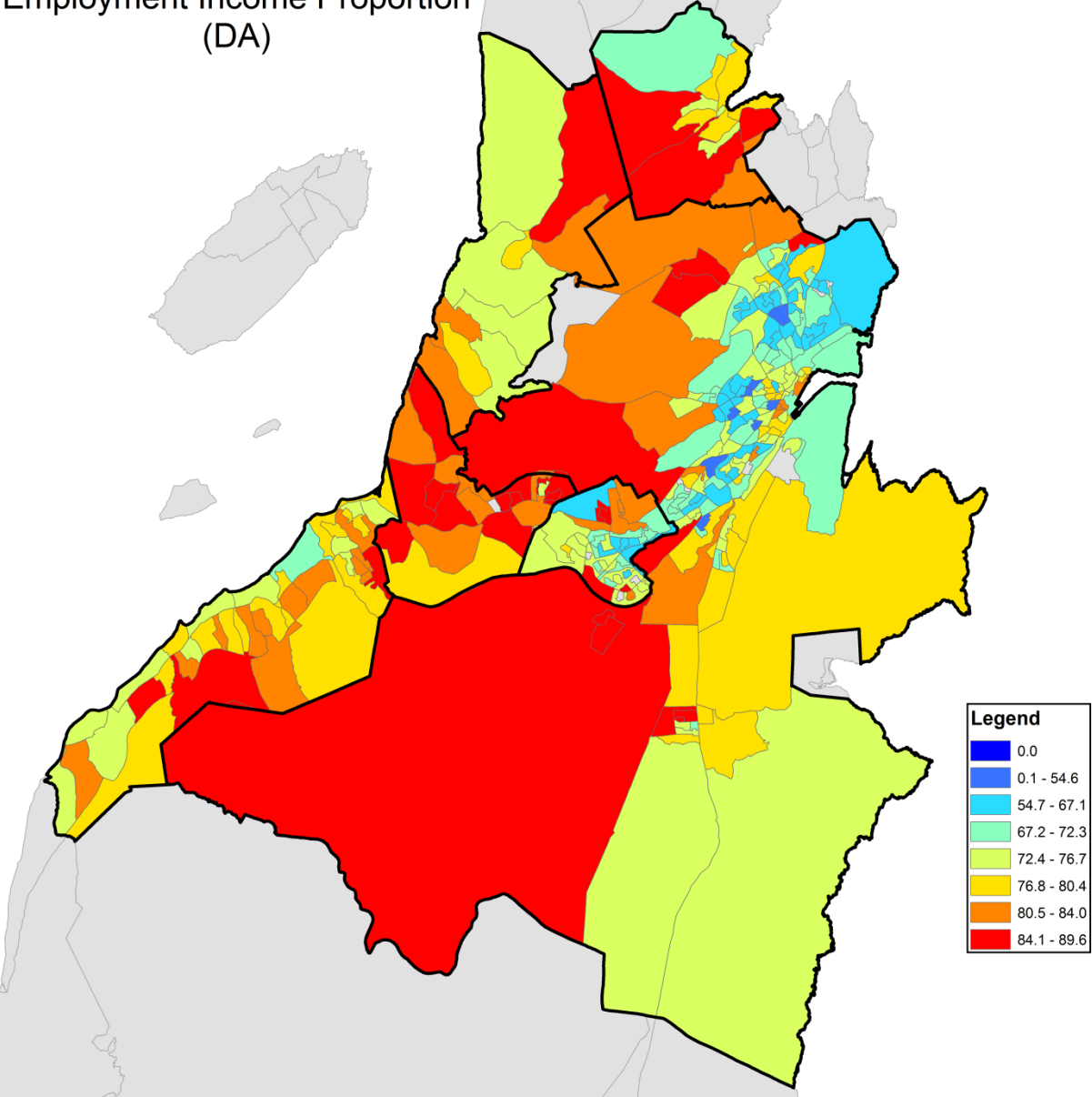




Market Income Proportion  
(DA)



Employment Income Proportion  
(DA)





- Future labour supply, and housing, retail and municipal demands forecast by converting population by single age cohort
- Define scenarios
  - Housing supply, labour demand, retail supply (developments?)
- Forward and backward effects of scenarios possible
  - E.g. if oil industry doubles?





- Questions?
- Discussion?