## Table S1

*Disablement Process Model definitions and examples [*[*1*](#_ENREF_1)*]*

| **Term** | **Definition** | **Examples** |
| --- | --- | --- |
| **Pathology** | Biochemical and physiological abnormalities that are detected and medically labeled as disease or injury. |
| **Sub-clinical pathology\***: detectable biochemical and physiological abnormalities not associated with impairment.  | - hypocholesteremia - reduced cardiac ejection fraction |
| **Acute pathology**\*: Short-term diseases and injuries, usually lasting three months or less. | - fall- delirium - lower respiratory tract infection |
| **Chronic pathology**: Progressive diseases, injuries with chronic sequelae, and enduring structural/sensory abnormalities | - arthritis- chronic obstructive pulmonary disease- heart failure |
| **Impairment** | Dysfunction and significant structural abnormalities in specific body systems that have consequences for physical, mental or social function.  | - cognitive impairment - chronic pain - visual impairment  |
| **Functional limitation** | Restrictions in performing physical and mental actions used in daily life by one’s age-sex group. Refers to individual capability without reference to situational requirements.  | Difficulty performing any of following actions: - walking specified distances- lifting objects of specified weight - climbing stairs |
| **Disability** | Difficulty with or dependence on others to conduct activities of daily living (ADLs), measured at a single point in time. | Difficulty with or dependence on others to conduct ADLs such as: - bathing- dressing- transferring from bed to chair- toileting- grooming- feeding |
| **Disablement** | Intensifying disability over at least two time points.  | Requiring additional assistance to conduct – or becoming newly dependent in – one of the self-care ADLs above.  |
| **Extra-Individual factors** | Factors that operate outside or external to a person and affect the Disablement Process. Can be grouped into one of the following categories:  |
| Medical care and rehabilitation | - surgery- physical therapy |
| Medications and other therapeutic regimens | - drugs taken- recreational therapy |
| External supports | - receipt of personal assistance e.g. meals on wheels- use of special equipment and devices  |
| Built physical and social environment | - structural modification at home - health insurance and access to medical care- laws and regulations |
| **Intra-Individual Factors**  | Factors that operate within a person and affect the Disablement Process. Can be grouped into one of the following categories:  |
| - Demographic characteristics - Biological attributes - Lifestyle and behavioral factors- Psychosocial attributes | - age, sex, race- genetics- smoking, physical activity - beliefs, religiosity, socioeconomic status  |

\*Sub-clinical and acute pathologies were not examined in this study due to lack of available data on sub-clinical pathologies and inability to study acute (incident) exposures in cross-sectional data.

## Table S2

*Items and Possible Responses in the RAI-MDS ADL Long Form Scale*

|  |  |
| --- | --- |
| **Item** | **Description**  |
| **Bed mobility**  | Includes how a resident moves and turns their body position while in bed. |
| **Transfer**  | Includes how a resident moves between surfaces such as bed and chair. |
| **Locomotion** | Includes how a resident moves between locations in their room and the corridor outside their room. |
| **Dressing** | Includes how a resident puts on, fastens and takes off all items of street clothing. |
| **Eating** | Relates to how a resident eats and drinks, including other means of nourishment intake, such as tube feeding.  |
| **Toilet use**  | This includes how a resident uses a toilet, commode, bedpan or urinal and transfer on and off a toilet. |
| **Personal hygiene**  | Relates to how personal hygiene is maintained, including combing hair, brushing teeth, washing and drying face and hands. Excludes baths and showers.  |
| Categories of response to each item include: **0**: total independence or no or little help with activity.**1**: supervision provided 3 or more times during last 7 days.**2**: limited assistance by staff with the resident highly involved in the activity.**3**: extensive assistance by staff with the resident performing part of the activity.**4**: total dependence/full staff participation in activity during the entire 7 days OR activity did not occur during past 7 days. |

## Table S3

*Chronic Conditions and Diagnostic Criteria Used to Identify them in Claims and Health Assessment Databases*

|  |  |  |  |
| --- | --- | --- | --- |
| **Chronic conditions** | **ICD-9***OHIP or CIHI-DAD* | **ICD-10***CIHI-DAD* | **RAI-MDS***CCRS\_LTC* |
| **Arthritis: osteo, rheumatoid and others**  | 274, 710, 711, 714-16, 718, 720, 727-729, 739 | M00-M03, M05-M07,M10-M25, M30-M36, M65-M73, M75-M77, M79 | I1L: arthritis  |
| **Asthma** | 493 |  J45 | I1JJ: asthma  |
| **Cancer**  | 140-165, 170-176, 179-208, 210-239 | C00-C26, C30-C34, C37-C41, C43-C58, C60-86, C88, C91-97 | I1RR: cancer  |
| **Coronary artery disease,** (including myocardial infarction) | 410-414 | I20-I25 | I1D: arteriosclerotic heart disease  |
| **Chronic obstructive pulmonary disease** | 491, 492, 496 | J41-J44 | I1KK: emphysema/COPD  |
| **Dementia** (including Alzheimer’s) | **OHIP**: 290, 331, 797**DAD**: 290, 294.1, 294.8, 294.9, 331.0, 331.1, 331.2, 797  | F000, F001, F002, F009-F013, F018-F024, F028, F03, F051, F065, F066, F068, F069, F09, G300 -G301, G308-G311, R54 | I1R: Alzheimer’s disease I1V: Dementia other than Alzheimer’s disease  |
| **Diabetes (Type 1 and 2)** | 250 | E10-E14 | I1A: Diabetes mellitus  |
| **Epilepsy**  | 345 | G40-G41 | I1CC: Seizure disorder  |
| **Heart failure**  | 428 | I500, I501, I509 | I1F: Congestive heart failure  |
| **Limb paralysis or amputation**  | 896, 897 | G82, G83, S48, S58, S68.3, S68.4, S68.8, S68.9, S78, S88, T05, T116, T136 | I1N: Missing limb (e.g. amputation)I1W: hemiplegia/hemiparesis I1Z: Paraplegia I1BB: Quadriplegia  |
| **Mood disorders**  | **OHIP:** 296 311**DAD:** 296.2, 296.3, 296.5. 311 | F30-F34 F38 F39 | I1GG: depressionI1HH: manic depressive (bipolar) |
| **Parkinson’s disease**  | 332 | G20-G22 | I1AA: Parkinson’s disease  |
| **Peripheral vascular disease** | **OHIP**: 440**DAD**: 440.2 |  I70.2 | I1J: Peripheral vascular disease  |
| **Psychiatric conditions other than depression and dementia**  | 291-292, 295, 297-298, 300-301, 303-310, 312, 315-319 | F04, F06, F07, F10-F25, F28-F29, F40-F45, 48 50-55, F59-F63, F68-F73, F78-F84, F88-F91, F94-F95, F98-F99**EXCEPT:** F063, F065, F066, F068, F069 | I1FF: anxiety disorder I1II: schizophrenia  |
| **Renal disease** | 583-586, 592, 593 | N00-N08, N11, N13-14, N16-N23 | I1UU: renal failure  |
| **Stroke** | 430-432, 434, 436 | I60-I64 | I1U: Cerebrovascular accident (stroke) |

## Table S4

*Geriatric Syndromes and Diagnostic Criteria Used to Identify them in the CCRS Database*

|  |  |  |
| --- | --- | --- |
| **Geriatric Syndromes**  | **CCRS\_LTC Variable** | **Re-Coding of Variable for Study** |
| **Balance impairment** | **G3A** | **Based on a test for balance while standing.0**: **Not balanced impaired** - G3A = 0 or 1 G3A =0: Maintained position as required  during test G3A =1: Unsteady, but able to rebalance self without physical support**1**: **Balance Impaired** - G3A = 2 or 3  G3A =2: Partial physical support during test; or stands but does not follow directions for  test G3A = 3: Not able to attempt test without physical help |
| **BMI** | **K2A:** Resident’s height in centimeters. **K2B**: Resident’s weight in kilograms (measured within 30 days of assessment). | Derived variable: BMI = bodyweight in kg/(height in meters)2 = **K2B/(K28/100)2**  |
| **Bowel incontinence**  | **H1A** | **0**: Continent - H1A = 0 or 1**1**: Bowel incontinent - H1A = 2, 3, 4 |
| **Cognitive status** | **CPS\_CC**  | **0**: Intact/ Borderline Intact - CPS\_CC = 0 or 1 **1**: Mild or mod. Impaired - CPS\_CC = 2 or 3**2**: Mod. severely Impaired - CPS\_CC = 4 **3**: Severely Impaired - CPS\_CC = 5 or 6  |
| **Hearing impairment** | **C1** | **0**: Not highly impaired - C1 = 0, 1**1**: Impaired C1 = 2, 3  |
| **Pain** | **PAIN\_CC** | **0**: No pain **1**: Less than daily pain **2**: Daily pain but not severe **3**: Severe daily pain  |
| **Pressure ulcer** | **M2A**  | **0:** No pressure ulcer - M2A = 0 or 1 **1:** Pressure ulcer present - M2A = 2, 3 or 4  |
| **Urinary incontinence** | **H1B** | **0**: Continent - H1B = 0, 1**1**: Urine incontinent - H1B = 2, 3, 4 |
| **Visual impairment**  | **D1**  | **0** – Adequate vision - D1 = 0 **1** – Impaired to mod. Impaired - D1 = 1, 2**2** – Highly or severely *impaired* - D1 = 3, 4  |

## Table S5

*All Variable Coefficient Estimates from Models 1 and 2*

|  | **Unadjusted Bivariate Regressions** | **Model 1**§ | **Model 2**|| |
| --- | --- | --- | --- |
|   | Estimate (95% CI) | Estimate (95% CI) | Estimate (95% CI) |
| Constant  |  | 4.07 (3.71, 4.44)‡ | 2.70 (2.18, 3.22)‡ |
| **Resident Characteristics** |  |  |  |
| Age |  |  |  |
|  65 – 74  | Reference | Reference | Reference |
|  75 – 84 | 0.76 (0.55, 0.98)‡ | 0.04 (-0.08, 0.17) | 0.04 (-0.08, 0.16) |
|  85 – 94  | 1.02 (0.81, 1.22)‡ | 0.18 (0.04, 0.31)\* | 0.18 (0.04, 0.31)\* |
|  95+ | 2.43 (2.16, 2.70)‡ | 0.61 (0.42, 0.80)‡ | 0.61 (0.42, 0.79)‡ |
| Sex |  |  |  |
|  Female | Reference | Reference | Reference |
|  Male | -1.03 (-1.16, -0.90)‡ | -0.37 (-0.46, -0.28) ‡ | -0.36 (-0.46, -0.27)‡ |
| Marital Status |  |  |  |
|  Married | Reference | Reference | Reference |
|  Widowed | -0.92 (-1.06, -0.78)‡ | -0.41 (-0.50, -0.31)‡ | -0.41 (-0.50, -0.31)‡ |
|  Never married,  separated or  divorced | -2.21 (-2.40, -2.01)‡ | -0.60 (-0.73, -0.48)‡ | -0.60 (-0.73, -0.48)‡ |
|  Missing data on  marital status | -1.23 (-1.73, -0.73)‡ | -0.64 (-0.96, -0.32)‡ | -0.64 (-0.97, -0.32)‡ |
| Pre-LTCH Neighborhood Income Quintile |  |  |  |
|  1 (low) | Reference | Reference | Reference |
|  2 | 0.56 (0.37, 0.75)‡ | 0.13 (0.01, 0.26)\* | 0.12 (0.002, 0.25)\* |
|  3 | 0.52 (0.33, 0.71)‡ | 0.19 (0.07, 0.31)† | 0.18 (0.06, 0.30)† |
|  4 | 0.96 (0.76, 1.15)‡ | 0.29 (0.17, 0.41)‡ | 0.27 (0.15, 0.39)‡ |
|  5 (high) | 0.95 (0.74, 1.15)‡ | 0.23 (0.10, 0.37)† | 0.23 (0.09, 0.36)† |
|  Missing data  | 1.54 (1.34, 1.75)‡ | 0.29 (0.14, 0.44)‡ | 0.28 (0.13, 0.43)‡ |
| Days in LTCH Prior to Index Date  |  | - | - |
|  0 - 4 months  | Reference | Reference | Reference |
|  > 4 months - 12  months  | -0.29 (-0.48, -0.11)† | -0.65 (-0.78, -0.52)‡ | -0.65 (-0.78, -0.52)‡ |
|  > 1 year - 2 years  | -0.01 (-0.19, 0.17) | -0.75 (-0.89, -0.62)‡ | -0.76 (-0.89, -0.62)‡ |
|  > 2 years - 3 years  | 0.81 (0.59, 1.02)‡ | -0.65 (-0.78, -0.51)‡ | -0.65 (-0.78, -0.51)‡ |
|  > 3 years  | 2.66 (2.50, 2.82)‡ | -0.31 (-0.44, -0.17)‡ | -0.30 (-0.44, -0.17)‡ |
| **Prevalent Geriatric Syndromes** |  |  |  |
| Balance impairment | 10.48 (10.34, 10.60)‡ | 5.69 (5.51, 5.87)‡ | 5.66 (5.48, 5.84)‡ |
| Bowel incontinence  | 10.46 (10.37, 10.55)‡ | 4.53 (4.38, 4.68)‡ | 4.52 (4.37, 4.67)‡ |
| Cognitive status |  |  |  |
|  Intact/borderline  | Reference | Reference | Reference |
|  Mild/moderate  impairment | 3.89 (3.76, 4.01)‡ | 1.67 (1.55, 1.79)‡ | 1.66 (1.54, 1.78)‡ |
|  Moderate-  severe/severe  impairment  | 11.73 (11.58, 11.87)‡ | 5.27 (5.10, 5.44)‡ | 5.26 (5.09, 5.43)‡ |
| Hearing impairment |  |  |  |
|  None | Reference | Reference | Reference |
|  Hearing impaired |  1.73 (1.55, 1.90)‡ | 0.03 (-0.08, 0.14) | 0.03 (-0.08, 0.13) |
|  Missing data  |  -0.56 (-1.80, 0.67) | 0.66 (-0.15, 1.46) | 0.67 (-0.11, 1.46) |
| Body mass index (BMI) |  |  |  |
|  BMI < 18.5 | Reference | Reference | Reference |
|  18.5 ≤ BMI ≤ 25 | -2.02 (-2.24, -1.80)‡ | -0.54 (-0.68, -0.40)‡ | -0.54 (-0.68, -0.40)‡ |
|  25 < BMI <30 | -3.49 (-3.72, -3.26)‡ | -0.87 (-1.03, -0.72)‡ | -0.88 (-1.03, -0.72)‡ |
|  BMI ≥ 30 | -3.74 (-3.98, -3.50)‡ | -0.59 (-0.75, -0.43)‡ | -0.60 (-0.76, -0.44)‡ |
| Pain |  |  |  |
|  None | Reference | Reference | Reference |
|  Less than daily  pain  | -0.70 (-0.85, -0.56)‡ | 0.29 (0.19, 0.39)‡ | 0.29 (0.19, 0.39)‡ |
|  Daily or severe  daily pain  | -0.12 (-0.29, 0.04) | 0.82 (0.70, 0.94)‡ | 0.83 (0.70, 0.95)‡ |
| Pressure ulcer | 6.47 (6.23, 6.72)‡ | 2.67 (2.52, 2.82)‡ | 2.67 (2.52, 2.82)‡ |
| Urinary incontinence | 10.50 (10.40, 10.61)‡ | 4.19 (4.04, 4.35)‡ | 4.20 (4.04, 4.35)‡ |
| Visual impairment  |  |  |  |
|  None | Reference | Reference | Reference |
|  Moderate  impairment | 3.09 (2.97, 3.22)‡ | 0.68 (0.59, 0.77)‡ | 0.68 (0.59, 0.76)‡ |
|  Severe  impairment  | 7.62 (7.40, 7.84)‡ | 2.49 (2.33, 2.65)‡ | 2.49 (2.33, 2.65)‡ |
| **Prevalent Chronic Conditions**  |  |  |  |
| Arthritis  | -0.66 (-0.78, -0.54)‡ | 0.08 (-.0003, 0.15) | 0.08 (0.0003, 0.15)\* |
| Asthma | -0.71 (-0.94, -0.48)‡ | 0.10 (-0.04, 0.24) | 0.10 (-0.04, 0.24) |
| Cancer  | -1.23 (-1.36, -1.11)‡ | -0.12 (-0.19, -0.04)† | -0.12 (-0.19, -0.04)† |
| Chronic kidney disease | 0.06 (0.08, 0.20)‡ | 0.31 (0.22, 0.40)‡ | 0.31 (0.22, 0.40)‡ |
| Coronary artery disease | -0.86 (-0.98, -0.74)‡ | -0.13 (-0.21, -0.05)† | -0.13 (-0.21, -0.05)† |
| Chronic obstructive pulmonary disease | -1.39 (-1.54, -1.25)‡ | -0.07 ( -0.17, 0.02) | -0.07 (-0.17, 0.02) |
| Dementia | 3.39 (3.22, 3.55)‡ | -0.22 (-0.35, -0.10)† | -0.23 (-0.36, -0.11)‡ |
| Diabetes | -0.09 (-0.21, 0.04) | -0.06 (-0.14, 0.02) | -0.06 (-0.14, 0.02) |
| Epilepsy  | 2.17 (1.94, 2.41)‡ | 0.47 (0.32, 0.61)‡ | 0.47 (0.33, 0.62)‡ |
| Heart failure  | -0.24 (-0.38, -0.11)‡ | 0.36 (0.27, 0.46)‡ | 0.36 (0.27, 0.45)‡ |
| Limb paralysis or amputation  | 4.49 (4.29, 4.70)‡ | 1.78 (1.63, 1.93)‡ | 1.77 (1.62, 1.92)‡ |
| Mood disorder  | 0.53 (0.41, 0.65)‡ | 0.30 (0.22, 0.38)‡ | 0.30 (0.22, 0.38)‡ |
| Parkinson’s disease  | 2.87 (2.66, 3.07)‡ | 1.75 (1.63, 1.87)‡ | 1.75 (1.63, 1.87)‡ |
| Peripheral vascular disease | -0.14 (-0.34, 0.07) | 0.03 (-0.10, 0.16) | 0.03 (-0.10, 0.16) |
| Psychiatric conditions other than depression and dementia  | -1.35 (-1.48, -1.22)‡ | -0.42 (-0.50, -0.33)‡ | -0.42 (-0.50, -0.33)‡ |
| Stroke | 1.85 (1.73, 1.98)‡ | 0.46 (0.38, 0.55)‡ | 0.46 (0.38, 0.55)‡ |
| **Fixed Long-Term Care Home Effects**¶ |
| LTCH Size |  |  |  |
|  Small (≤64) | Reference | N/A | Reference |
|  Medium (65 – 128) | 0.10 (-0.38, 0.58) | N/A | -0.05 (-0.32, 0.21) |
|  Large (129 – 192) | 0.37 (-0.16, 0.89) | N/A | 0.08 (-0.24, 0.40) |
|  Extra-large ( ≥193)  | 0.79 (0.19, 1.39) | N/A | 0.25 (-0.13, 0.63) |
| Ownership status  |
|  Not-for-profit | Reference | N/A | Reference |
|  For-profit | 0.28 (-0.12, 0.68) | N/A | 0.23 (0.006, 0.46)\* |
|  Missing data  | -3.64 (-5.26, -2.02)‡ | N/A | 0.44 (-0.47, 1.35) |
| Location |
|  Rural | Reference | N/A | Reference |
|  Sub-urban | 0.28 (-0.25, 0.82) | N/A | 0.14 (-0.22, 0.49) |
|  Urban | 1.47 (1.02, 1.92)‡ | N/A | -0.12 ( -0.41, 0.15) |
| Mean % residents received physio- or occupational therapy (Quartiles) |  |  |  |
|  Lowest quartile | Reference | N/A | Reference |
|  2nd quartile  | 0.004 (-0.57, 0.57) | N/A | 0.17 (-0.13, 0.47) |
|  3rd quartile  | 0.78 (0.21, 1.35)† | N/A | 0.14 (-0.17, 0.45) |
|  Highest quartile | 0.53 (-0.01, 1.07) | N/A | -0.05 (-0.35, 0.24) |
| Mean % residents restrained (Quartiles) |  |  |  |
|  Lowest quartile | Reference | N/A | Reference |
|  2nd quartile  | -0.32 (-0.89, 0.25) | N/A | 0.007 (-0.30, 0.32) |
|  3rd quartile  | -0.19 (-0.79, 0.41) | N/A | -0.23 (-0.54, 0.07) |
|  Highest quartile | 0.50 (-0.06, 1.05) | N/A | -0.14 (-0.45, 0.16) |
| Median Resident ADL in each home (Quartiles) |  |  |  |
|  Lowest quartile | Reference | N/A | Reference |
|  2nd quartile  | 1.87 (1.58, 2.17) ‡ | N/A | 1.16 (0.87, 1.46) ‡ |
|  3rd quartile  | 2.75 (2.45, 3.06) ‡ | N/A | 1.62 (1.30, 1.94) ‡ |
| Highest quartile  | 4.76 (4.43, 5.10) ‡ | N/A | 2.81 (2.50, 3.11) ‡ |
| **Random Effects** |  |  |  |
| √ψ | - | 1.58 (1.50, 1.68) | 1.21 (1.13, 1.28) |
| √θ | - | 4.90 (4.84, 4.96) | 4.90 (4.84, 4.96) |
| **Derived Estimates** |  |  |  |
| R2 | - | 0.627 | 0.642 |
| ρ | - | 0.095 | 0.057 |

Legend:

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001

§**Model 1:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home; includes random intercept for long-term care homes

||**Model 2:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home, as well as the following long-term care home variables: size, ownership type, location, proportion of residents who recently received physiotherapy or occupation therapy, proportion of residents restrained, and median resident disability. Also a random intercept for long-term care homes.

¶LTCH coefficient estimates have standard errors adjusted for clustering of residents within long-term care homes.

***√ψ***: Square root of between-long-term care home variance

***√θ***: Square root of within-long-term care home variance

The **null model** of disability containing only random LTCH intercepts and no explanatory resident or LTCH variables had a within-LTCH variance of 66.91 and a between-LTCH variance of 4.16; variances from all multivariable models were compared to these values to estimate proportion of variance explained (*R2*).
***R2***: The proportional reduction in the estimated total residual variance compared to the null model (Model 1)

**ρ**:Proportion of variance that is explained by LTCH characteristics = ψ/(ψ+θ)
**N/A**: Not applicable because variable not included in model.

## Table S6

*Model 1 Excluding Chronic Conditions, Geriatric Syndromes*

| **Variables** | **Model 1** | **Model 1 excluding chronic conditions**  | **Model 1 excluding geriatric syndromes**  | **Model 1, with only adjustment variables and select geriatric syndromes** |
| --- | --- | --- | --- | --- |
| **Resident Characteristics** |  |  |  |  |
| Age |  |  |  |  |
|  65 – 74  | Reference | Reference | Reference |  |
|  75 – 84 | 0.04 (-0.08, 0.17) | -0.08 (-0.21, 0.04) | 0.60 (0.39, 0.82)‡ | N/A |
|  85 – 94  | 0.18 (0.04, 0.31)\* | -0.10 (-0.24, 0.03) | 1.16 (0.93, 1.39)‡ | N/A |
|  95+ | 0.61 (0.42, 0.80)‡ | 0.20 (0.02, 0.39)\* | 2.61 (2.31, 2.91)‡ | N/A |
| Sex |  |  |  |  |
|  Female | Reference | Reference | Reference |  |
|  Male | -0.37 (-0.46, -0.28) ‡ | -0.18 (-0.27, -0.09)‡ | -1.38 (-1.53, -1.24)‡ | N/A |
| Marital Status |  |  |  |  |
|  Married | Reference | Reference | Reference |  |
|  Widowed | -0.41 (-0.50, -0.31)‡ | -0.47 (-0.56, -0.37)‡ | -1.58 (-1.74, -1.43)‡ | N/A |
|  Never married,  separated or  divorced | -0.60 (-0.73, -0.48)‡ | -0.75 (-0.87, -0.62)‡ | -2.22 (-2.42, -2.02)‡ | N/A |
|  Missing data on  marital status | -0.64 (-0.96, -0.32)‡ | -0.76 (-1.10, -0.43)‡ | -1.45 (-1.94, -0.96)‡ | N/A |
| Pre-LTCH Neighborhood Income Quintile |  |  |  |  |
|  1 (low) | Reference | Reference | Reference |  |
|  2 | 0.13 (0.01, 0.26)\* | 0.16 (0.03, 0.28)\* | 0.29 (0.10, 0.48)† | N/A |
|  3 | 0.19 (0.07, 0.31)† | 0.22 (0.10, 0.34)‡ | 0.37 (0.17, 0.57)‡ | N/A |
|  4 | 0.29 (0.17, 0.41)‡ | 0.32 (0.19, 0.44)‡ | 0.61 (0.41, 0.80)‡ | N/A |
|  5 (high) | 0.23 (0.10, 0.37)† | 0.27 ( 0.13, 0.41)‡ | 0.59 (0.39, 0.79)‡ | N/A |
|  Missing data  | 0.29 (0.14, 0.44)‡ | 0.34 (0.18, 0.49)‡ | 1.07 (0.81, 1.32)‡ | N/A |
| Days in LTC Prior to Index Date  | - |  |  |  |
|  0 - 4 months  | Reference | Reference | Reference |  |
|  > 4 months - 12  months  | -0.65 (-0.78, -0.52)‡ | -0.62 (-0.75, -0.48)‡ | -0.48 (-0.66, -0.30)‡ | N/A |
|  > 1 year - 2 years  | -0.75 (-0.89, -0.62)‡ | 0.73 (-0.87, -0.60)‡ | -0.38 (-0.58, -0.17)‡ | N/A |
|  > 2 years - 3 years  | -0.65 (-0.78, -0.51)‡ | -0.64 (-0.78, -0.50)‡ | 0.32 (0.08, 0.57)‡ | N/A |
|  > 3 years  | -0.31 (-0.44, -0.17)‡ | -0.28 (-0.41, -0.14)‡ | 2.10 (1.88, 2.33)\* | N/A |
| **Prevalent Geriatric Syndromes** |  |  |  |  |
|  Balance impairment | 5.69 (5.51, 5.87)‡ | 6.04 (5.86, 6.22)‡ | N/A | 6.38 (6.19, 6.56) ‡ |
|  Bowel incontinence  | 4.53 (4.38, 4.68)‡ | 4.61 (4.46, 4.77)‡ | N/A | 4.91 (4.75, 5.07)‡ |
|  Cognitive status |  |  |  |  |
|  Intact/borderline  | Reference | Reference |  |  |
|  Mild/moderate  impairment | 1.67 (1.55, 1.79)‡ | 1.51 (1.39, 1.63)‡ | N/A | 1.46 (1.34, 1.59)‡ |
|  Moderate-  severe/severe  impairment  | 5.27 (5.10, 5.44)‡ | 4.97 (4.80, 5.13)‡ | N/A | 5.27 (5.11, 5.44)‡ |
|  Hearing impairment |  |  |  |  |
|  None | Reference | Reference |  |  |
|  Hearing impaired | 0.03 (-0.08, 0.14) | -0.01 (-0.12, 0.10) | N/A | N/A |
|  Missing data  | 0.66 (-0.15, 1.46) | 0.62 (-0.18, 1.42) | N/A | N/A |
|  Body mass index  (BMI) |  |  |  |  |
|  BMI < 18.5 | Reference | Reference |  |  |
|  18.5 ≤ BMI ≤ 25 | -0.54 (-0.68, -0.40)‡ | -0.53 (-0.67, -0.39)‡ | N/A | N/A |
|  25 < BMI <30 | -0.87 (-1.03, -0.72)‡ | -0.86 (-1.01, -0.70)‡ | N/A | N/A |
|  BMI ≥ 30 | -0.59 (-0.75, -0.43)‡ | -0.56 (-0.72, -0.41)‡ | N/A | N/A |
|  Pain |  |  |  |  |
|  None | Reference | Reference |  |  |
|  Less than daily  pain  | 0.29 (0.19, 0.39)‡ | 0.35 (0.25, 0.45)‡ | N/A | N/A |
|  Daily or severe  daily pain  | 0.82 (0.70, 0.94)‡ | 0.86 (0.74, 0.98)‡ | N/A | N/A |
|  Pressure ulcer | 2.67 (2.52, 2.82)‡ | 2.79 (2.64, 2.94)‡ | N/A | N/A |
|  Urinary  incontinence | 4.19 (4.04, 4.35)‡ | 4.32 (4.16, 4.48)‡ | N/A | 4.26 (4.09, 4.42)‡ |
|  Visual impairment  |  |  |  |  |
|  None | Reference | Reference |  |  |
|  Moderate  impairment | 0.68 (0.59, 0.77)‡ | 0.72 (0.63, 0.81)‡ | N/A | N/A |
|  Severe impairment  | 2.49 (2.33, 2.65)‡ | 2.47 (2.31, 2.63)‡ | N/A | N/A |
| **Prevalent Chronic Conditions**  |  |  |  |  |
|  Arthritis  | 0.08 (-.0003, 0.15) | N/A | -0.26 (-0.37, -0.14)‡ | N/A |
|  Asthma | 0.10 (-0.04, 0.24) | N/A | -0.16 (-0.38, 0.06) | N/A |
|  Cancer  | -0.12 (-0.19, -0.04)† | N/A | -0.80 (-0.92, -0.68)‡ | N/A |
|  Chronic kidney  disease | 0 .31 (0.22, 0.40)‡ | N/A | 0.52 (0.39, 0.65)‡ | N/A |
|  Coronary artery  disease | -0.13 (-0.21, -0.05)† | N/A | -0.61 (-0.74, -0.48)‡ | N/A |
|  Chronic obstructive  pulmonary disease | -0.07 ( -0.17, 0.02) | N/A | -0.61 (-0.76, -0.45)‡ | N/A |
|  Dementia | -0.22 (-0.35, -0.10)† | N/A | 3.29 (3.07, 3.50)‡ | N/A |
|  Diabetes | -0.06 (-0.14, 0.02) | N/A | -0.03 (-0.15, 0.10) | N/A |
|  Epilepsy  | 0.47 (0.32, 0.61)‡ | N/A | 1.71 (1.48, 1.94)‡ | N/A |
|  Heart failure  | 0.36 (0.27, 0.46)‡ | N/A | 0.45 (0.32, 0.58)‡ | N/A |
|  Limb paralysis or  amputation  | 1.78 (1.63, 1.93)‡ | N/A | 4.02 (3.79, 4.24)‡ | N/A |
|  Mood disorder  | 0.30 (0.22, 0.38)‡ | N/A | 0.38 (0.26, 0.51)‡ | N/A |
|  Parkinson’s disease  | 1.75 (1.63, 1.87)‡ | N/A | 3.11 (2.94, 3.29)‡ | N/A |
|  Peripheral vascular  disease | 0.03 (-0.10, 0.16) | N/A | 0.09 (-0.11, 0.29) | N/A |
|  Psychiatric  conditions other  than depression and  dementia  | -0.42 (-0.50, -0.33)‡ | N/A | -1.09 (-1.23, -0.95)‡ | N/A |
|  Stroke | 0.46 (0.38, 0.55)‡ | N/A | 1.21 (1.07, 1.34)‡ | N/A |
| **Random Effects** |  |  |  |  |
| √ψ | 1.58  | 1.62 | 1.85 | 1.61  |
| √θ | 4.90  | 4.97 | 7.73 | 5.09  |
| **Derived Estimates** |  |  |  |  |
| R2 | 0.627 | 0.616 | 0.112 | 0.599 |
| ρ | 0.095 | 0.096 | 0.054 | 0.091 |

Legend:

**Model 1:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home; includes random intercept for long-term care homes

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001
***√ψ***: Square root of between-long-term care home variance

***√θ***: Square root of within-long-term care home variance

The **null model** of disability containing only random LTCH intercepts and no explanatory resident or LTCH variables had a within-LTCH variance of 66.91 and a between-LTCH variance of 4.16; variances from all multivariable models were compared to these values to estimate proportion of variance explained (*R2*).
***R2***: The proportional reduction in the estimated total residual variance compared to the null model (Model 1)

**ρ**:Proportion of variance that is explained by LTCH characteristics = ψ/(ψ+θ)
**N/A**: Not applicable because variable not included in model.

## Table S7

*All Variable Coefficient Estimates from Stratified Versions of Model 1*

|  | **Model 1** | **Sex Stratified Models** | **Age Stratified Models** | **Cognitive Status-Stratified Models** |
| --- | --- | --- | --- | --- |
|  |  | **Females****(n=54,953)** | **Males (n=22,212)** | **Age 65-74(n=7,859)** | **Age 75-84(n=25,703)** | **Age 85-94(n=36,676)** | **Age 95-105****(n=6,927)** | **No cognitive impairment****(n=18,426)** | **Cognitive impairment present****(n = 58,739)** |
| Age |  |  |  |  |  |  |  |  |  |
|  65 – 74  | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  75 – 84 | 0.04(-0.08, 0.17) | 0.08 (-0.009, 0.25) | -0.04 (-0.25, 0.16) | N/A | N/A | N/A | N/A | -0.15 (-0.40, 0.10) | 0.04 (-0.12, 0.20) |
|  85 – 94  | 0.18(0.04, 0.31)\* | 0.23 (0.05, 0.41)\* | 0.04 (-0.18, 0.26) | N/A | N/A | N/A | N/A | -0.10 (-0.39, 0.18) | -0.01 (-0.18, 0.16) |
|  95+ | 0.61(0.42, 0.80)‡ | 0.69 (0.46, 0.91)‡ | 0.36 (-0.02, 0.74) | N/A | N/A | N/A | N/A | 0.62 (0.21, 1.02)† | 0.16 (-0.06, 0.38) |
| Sex |  |  |  |  |  |  |  |  |  |
|  Female | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Male | -0.37(-0.46, -0.28) ‡ | N/A | N/A | -0.50 (-0.75, -0.26)‡ | -0.40 (-0.54, -0.26)‡ | -0.28 (-0.43, -0.13)‡ | -0.44 (-0.79, -0.09)\* | -0.29 (-0.48, -0.10)† | -0.47 (-0.58, -0.36)‡ |
| Marital Status |  |  |  |  |  |  |  |  |  |
|  Married | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Widowed | -0.41(-0.50, -0.31)‡ | -0.45 (-0.57, -0.34)‡ | -0.28 (-0.44, -0.12)† | -0.61 (-0.93, -0.28)‡ | -0.46 (-0.61, -0.31)‡ | -0.25 (-0.40, -0.11)† | -0.26 (-0.77, 0.24) | -0.23 (-0.43, -0.02)\* | -0.71 (-0.82, -0.60)‡ |
|  Never married,  separated or  divorced | -0.60(-0.73, -0.48)‡ | -0.59 (-0.76, -0.43)‡ | -0.60 (-0.79, -0.41)‡ | -0.81 (-1.09, -0.52)‡ | -0.75 (-0.95, -0.55)‡ | -0.30 (-0.51, -0.08)† | -0.15 (-0.80, 0.50) | -0.33 (-0.59, -0.07)\* | -1.09 (-1.23, -0.94)‡ |
|  Missing data on  marital status | -0.64(-0.96, -0.32)‡ | -0.63 (-1.06, -0.20)†  | -0.64 (-1.13, -0.15)\* | -0.82 (-1.70, 0.06) | -0.72 (-1.30, -0.13)\* | -0.47 (-1.01, 0.06) | -0.67 (-1.84, 0.51) | -0.08 (-0.85, 0.68) | -0.97 (-1.36, -0.57)‡ |
| Pre-LTCH Neighborhood Income Quintile |  |  |  |  |  |  |  |  |  |
|  1 (low) | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  2 | 0.13(0.01, 0.26)\* | 0.13 (-0.01, 0.28) | 0.16 (-0.06, 0.38) | 0.15 (-0.20, 0.51) | -0.01 (-0.21, 0.19) | 0.24 (0.08, 0.41)† | 0.18 (-0.19, 0.56) | 0.14 (-0.13, 0.41) | 0.15 (0.006, 0.29)\*  |
|  3 | 0.19(0.07, 0.31)† | 0.21(0.07, 0.35)† | 0.12 (-0.08, 0.31) | 0.08 (-0.26, 0.42) | 0.08 (-0.13, 0.29) | 0.27 (0.11, 0.43)† | 0.17 (-0.20, 0.54) | 0.17 (-0.11, 0.45) | 0.19 (0.05, 0.32)† |
|  4 | 0.29(0.17, 0.41)‡ | 0.32(0.17, 0.47)‡ | 0.23 (0.03, 0.44)\* | 0.36 (-0.03, 0.76) | 0.20 (-0.007, 0.40) | 0.36 (0.19, 0.54)‡ | 0.27 (-0.12, 0.66) | 0.34 (0.06, 0.61)\* | 0.30 (0.16, 0.44)‡ |
|  5 (high) | 0.23(0.10, 0.37)† | 0.27(0.11, 0.42)† | 0.18 (-0.05, 0.40) | 0.34 (-0.07, 0.76) | 0.25 (0.03, 0.46)\* | 0.24 (0.05, 0.43)† | 0.05 (-0.35, 0.46) | 0.14 (-0.16, 0.45) | 0.32 (0.17, 0.47)‡ |
|  Missing data  | 0.29(0.14, 0.44)‡ | 0.27 (0.09, 0.45)† | 0.40 (0.15, 0.65)† | 0.009 (-0.43, 0.45) | 0.17 (-0.05, 0.40) | 0.46 (0.25, 0.67)‡ | 0.21 (-0.22, 0.64) | -0.07 (-0.40, 0.27) | 0.44 (0.27, 0.61)‡ |
| Days in LTC Prior to Index Date  |  |  |  |  |  |  |  |  |  |
|  0 - 4 months  | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  > 4 months - 12  months  | -0.65(-0.78, -0.52)‡ | -0.64(-0.79, -0.48)‡ | -0.66 (-0.86, -0.45)‡ | -0.36 (-0.70, -0.02)\* | -0.61 (-0.81, -0.41)‡ | -0.70 (-0.86, -0.53)‡ | -0.91 (-1.35, -0.48)‡ | -1.17 (-1.42, -0.93)‡ | -0.44 (-0.58, -0.29)‡ |
|  > 1 year - 2  years  | -0.75(-0.89, -0.62)‡ | -0.77 (-0.93, -0.61)‡ | -0.68 (-0.89, -0.48)‡ | -0.30 (-0.67, 0.06) | -0.64 (-0.86, -0.43)‡ | -0.86 (-1.04, -0.69)‡ | -1.10 (-1.53, -0.68)‡ | -1.59 (-1.85, -1.32)‡ | -0.36 (-0.51, -0.21)‡ |
|  > 2 years - 3  years  | -0.65 (-0.78, -0.51)‡ | -0.63 (-0.80, -0.46)‡ | -0.63 (-0.88, -0.38)‡ | -0.41 (-0.85, 0.02) | -0.42 (-0.65, -0.19)‡ | -0.83 (-1.02, -0.64)‡ | -0.61 (-1.06, -0.17)† | -1.76 (-2.05, -1.47)‡ | -0.09 (-0.25, 0.07) |
|  > 3 years  | -0.31 (-0.44, -0.17)‡ | -0.21 (-0.36, -0.05)‡ | -0.61 (-0.81, -0.41)‡ | -0.40 (-0.75, -0.05)\* | -0.15 (-0.36, 0.06) | -0.37 (-0.53, -0.21)‡ | -0.56 (-0.92, -0.20)† | -1.96 (-2.20, -1.71)‡ | 0.64 (0.48, 0.79)‡ |
| Prevalent Geriatric Syndromes |  |  |  |  |  |  |  |  |  |
|  Balance  impairment | 5.69 (5.51, 5.87)‡ | 5.73 (5.52, 5.93)‡ | 5.51 (5.28, 5.74)‡ | 5.94 (5.57, 6.31)‡ | 5.71 (5.49, 5.93)‡ | 5.46 (5.25, 5.68)‡ | 5.42 (5.00, 5.85)‡ | 5.55 (5.31, 5.80)‡ | 5.95 (5.75, 6.16)‡ |
|  Bowel  incontinence  | 4.53 (4.38, 4.68)‡ | 4.43 (4.26, 4.60)‡ | 4.77 (4.57, 4.97)‡ | 5.00 (4.66, 5.33)‡ | 4.61 (4.41, 4.82)‡ | 4.46 (4.28, 4.65)‡ | 3.98 (3.65, 4.32)‡ | 4.60 (4.35, 4.86)‡ | 5.43 (5.26, 5.60)‡ |
|  Cognitive status |  |  |  |  |  |  |  |  |  |
|  Intact/borderline  | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Mild/moderate  impairment | 1.67 (1.55, 1.79)‡ | 1.69 (1.55, 1.83)‡ | 1.67 (1.46, 1.88)‡ | 1.14 (0.85, 1.43)‡ | 1.51 (1.31, 1.70)‡ | 1.88 (1.71, 2.04)‡ | 1.86 (1.50, 2.22)‡ | N/A | N/A |
|  Moderate-  severe/severe  impairment  | 5.27 (5.10, 5.44)‡ | 5.40 (5.21, 5.59)‡ | 4.94 (4.67, 5.21)‡ | 4.21 (3.81, 4.61)‡ | 5.16 (4.91, 5.41)‡ | 5.57 (5.34, 5.79)‡ | 5.35 (4.88, 5.81)‡ | N/A | N/A |
|  Hearing  impairment |  |  |  |  |  |  |  |  |  |
|  None | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Hearing  impaired | 0.03 (-0.08, 0.14) | 0.02 (-0.12 0.15) | 0.07 (-0.12, 0.26) | -0.13 (-0.71, 0.45) | -0.04 (-0.26, 0.18) | -0.04 (-0.18, 0.11) | 0.26 (0.002, 0.51)\* | 0.43 (0.14, 0.72)† | 0.08 (-0.04, 0.20) |
|  Missing data  | 0.66 (-0.15, 1.46) | 0.33 (-0.67, 1.34) | 1.21 (-0.09, 2.52) | 1.85 (-0.79, 4.49) | 0.005 (-1.21, 1.22) | 1.18 (-0.21, 2.57) | 0.007 (-3.06, 3.08) | 0.32 (-1.27, 1.90) | 0.74 (-0.16, 1.64) |
|  Body mass  index (BMI) |  |  |  |  |  |  |  |  |  |
|  BMI < 18.5 | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  18.5 ≤ BMI ≤  25 | -0.54 (-0.68, -0.40)‡ | -0.56 (-0.71, -0.41)‡ | -0.52 (-0.84, -0.21)† | -0.03 (-0.57, 0.52) | -0.46 (-0.72, -0.19)† | -0.67 (-0.86, -0.49)‡ | -0.55 (-0.89, -0.20)† | -0.80 (-1.16, -0.43)‡ | -0.51 (-0.66, -0.36)‡ |
|  25 < BMI <30 | -0.87 (-1.03, -0.72)‡ | -0.83 (-0.99, -0.66)‡ | -1.04 (-1.36, -0.71)‡ | -0.69 (-1.24, -0.14)\* | -0.82 (-1.09, -0.54)‡ | -0.96 (-1.17, -0.76)‡ | -0.83 (-1.23, -0.44)‡ | -1.04 (-1.42, -0.67)‡ | -0.97 (-1.14, -0.80)‡ |
|  BMI ≥ 30 | -0.59 (-0.75, -0.43)‡ | -0.52 (-0.69, -0.34)‡ | -0.89 (-1.24, -0.53)‡ | -0.68 (-1.23, -0.12)\* | -0.55 (-0.84, -0.26)‡ | -0.62 (-0.84, -0.41)‡ | -0.31 (-0.80, 0.18) | -0.50  (-0.89,-0.10)† | -0.98 (-1.16, -0.81)‡ |
|  Pain |  |  |  |  |  |  |  |  |  |
|  None | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Less than  daily pain  | 0.29 (0.19, 0.39)‡ | 0.25 (0.13, 0.36)‡ | 0.39 (0.22, 0.57)‡ | 0.26 (-0.03, 0.54) | 0.18 (0.03, 0.34)\* | 0.34 (0.20, 0.48)‡ | 0.19 (-0.09, 0.48) | 0.50 (0.30, 0.69)‡ | -0.007 (-0.12, 0.11) |
|  Daily or  severe daily  pain  | 0.82 (0.70, 0.94)‡ | 0.78 (0.64, 0.92)‡ | 0.90 (0.68, 1.13)‡ | 0.70 (0.35, 1.05)‡ | 0.76 (0.57, 0.95)‡ | 0.86 (0.69, 1.02)‡ | 0.67 (0.28, 1.05)† | 0.81 (0.59, 1.04)‡ | 0.62 (0.47, 0.76)‡ |
|  Pressure ulcer | 2.67 (2.52, 2.82)‡ | 2.70 (2.52, 2.87)‡ | 2.59 (2.32, 2.86)‡ | 3.03 (2.57, 3.48)‡ | 2.70 (2.45, 2.95)‡ | 2.63 (2.42, 2.84)‡ | 2.39 (1.98, 2.81)‡ | 3.34 (2.98, 3.71)‡ | 2.78 (2.62, 2.94)‡ |
|  Urinary  incontinence | 4.19 (4.04, 4.35)‡ | 4.30 (4.12, 4.49)‡ | 3.97 (3.76, 4.19)‡ | 4.00 (3.66, 4.34)‡ | 4.19 (3.98, 4.40)‡ | 4.28 (4.08, 4.49)‡ | 4.06 (3.66, 4.45)‡ | 4.48 (4.25, 4.71)‡ | 4.28 (4.10, 4.46)‡ |
|  Visual  impairment  |  |  |  |  |  |  |  |  |  |
|  None | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference | Reference |
|  Moderate  impairment | 0.68 (0.59, 0.77)‡ | 0.68 (0.57, 0.78)‡ | 0.70 (0.55, 0.85)‡ | 0.73 (0.48, 0.98)‡ | 0.64 (0.50, 0.79)‡ | 0.67 (0.55, 0.79)‡ | 0.80 (0.53, 1.07)‡ | 0.53 (0.33, 0.73)‡ | 0.99 (0.88, 1.09)‡ |
|  Severe  impairment  | 2.49 (2.33, 2.65)‡ | 2.45 (2.27, 2.63)‡ | 2.58 (2.30, 2.86)‡ | 2.82 (2.38, 3.26)‡ | 2.72 (2.45, 3.00)‡ | 2.39 (2.18, 2.60)‡ | 2.21 (1.83, 2.59)‡ | 1.98 (1.49, 2.48)‡ | 3.50 (3.32, 3.67)‡ |
| Prevalent Chronic Conditions  |  |  |  |  |  |  |  |  |  |
|  Arthritis  | 0.08 (-.0003, 0.15) | 0.09 (-0.007, 0.18) | 0.04 (-0.09, 0.16) | -0.16 (-0.40, 0.08) | 0.10 (-0.03, 0.23) | 0.12 (0.006, 0.23)\* | 0.13 (-0.11, 0.38) | 0.13 (-0.05, 0.32) | -0.10 (-0.18, -0.008)\* |
|  Asthma | 0.10 (-0.04, 0.24) | 0.09 (-0.06, 0.24) | 0.17 (-0.11, 0.45) | 0.03 (-0.42, 0.48) | 0.10 (-0.14, 0.34) | 0.20 (-0.001, 0.40) | -0.11 (-0.62, 0.39) | 0.07 (-0.22, 0.35) | 0.08 (-0.07, 0.24) |
|  Cancer  | -0.12 (-0.19, -0.04)† | -0.15 (-0.25, -0.06)† | -0.06 (-0.20, 0.06) | -0.09 (-0.36, 0.18) | -0.16 (-0.29, -0.03)\* | -0.08 (-0.20, 0.02) | -0.17 (-0.43, 0.08) | -0.20 (-0.38, -0.03)\* | -0.21 (-0.30, -0.12)‡ |
|  Chronic kidney  disease | 0 31 (0.22, 0.40)‡ | 0.26(0.15, 0.37)‡ | 0.40 (0.24, 0.55)‡ | 0.39 (0.09, 0.68)\* | 0.32 (0.17, 0.48)‡ | 0.31 (0.18, 0.44)‡ | 0.32 (0.02, 0.62)\* | 0.22 (0.03, 0.41)\* | 0.26, (0.15, 0.36)‡ |
|  Coronary artery  disease | -0.13 (-0.21, -0.05)† | -0.11 (-0.20, -0.02)\* | -0.18 (-0.32, -0.04)\* | -0.29 (-0.56, -0.02)\*  | -0.04 (-0.17, 0.10) | -0.15 (-0.26, -0.04)\* | -0.19 (-0.44, 0.05) | -0.25 (-0.43, -0.08)† | -0.17 (-0.26, -0.07)‡ |
|  Chronic  obstructive  pulmonary  disease | -0.07 (-0.17, 0.02) | -0.09 (-0.21, 0.02) | -0.04 (-0.20, 0.12) | -0.09 (-0.38, 0.21) | -0.30 (-0.47, -0.14)‡ | 0.08 (-0.05, 0.21) | 0.11 (-0.21, 0.44) | -0.16 (-0.35, 0.03) | -0.23 (-0.34, -0.12)‡ |
|  Dementia | -0.22 (-0.35, -0.10)† | -0.32 (-0.47, -0.17)‡ | 0.02 (-0.20, 0.23) | -0.41 (-0.72, -0.10)\* | -0.39 (-0.61, -0.17)‡ | -0.10 (-0.29, 0.08) | 0.21 (-0.16, 0.59) | -0.25 (-0.43, -0.06)† | 0.23 (0.06, 0.40)† |
|  Diabetes | -0.06 (-0.14, 0.02) | -0.03 (-0.13, 0.07) | -0.12 (-0.25, 0.01) | -0.24 (-0.49, 0.009) | -0.10 (-0.23, 0.03) | -0.004 (-0.12, 0.12) | 0.32 (0.04, 0.60)\* | -0.34 (-0.52, -0.16)‡  | -0.12 (-0.21, -0.03)\* |
|  Epilepsy  | 0.47 (0.32, 0.61)‡ | 0.61 (0.44, 0.78)‡ | 0.20 (-0.03, 0.44) | 0.47 (0.16, 0.77)† | 0.36 (0.14, 0.58)† | 0.60 (0.37, 0.84)‡ | -0.05 (-0.77, 0.67) | 0.13 (-0.23, 0.49) | 0.62 (0.46, 0.79)‡ |
|  Heart failure  | 0.36 (0.27, 0.46)‡ | 0.36 (0.25, 0.47)‡ | 0.37 (0.20, 0.53)‡ | 0.31 (-0.009, 0.63) | 0.41 (0.24, 0.58)‡ | 0.35 (0.22, 0.48)‡ | 0.34 (0.06, 0.61)\*  | 0.47 (0.29, 0.65)‡ | 0.20 (0.09, 0.31)‡ |
|  Limb paralysis  or  amputation  | 1.78 (1.63, 1.93)‡ | 1.81 (1.63, 2.00)‡ | 1.79 (1.55, 2.02)‡ | 1.59 (1.27, 1.91)‡ | 1.93 (1.70, 2.17)‡ | 1.77 (1.55, 1.99)‡ | 1.57 (1.11, 2.04)‡ | 2.54 (2.24, 2.83)‡ | 1.44 (1.27, 1.60)‡ |
|  Mood disorder  | 0.30 (0.22, 0.38)‡ | 0.32 (0.23, 0.42)‡ | 0.26 (0.12, 0.41)‡ | -0.10 (-0.33, 0.14) | 0.20 (0.08, 0.33)† | 0.44 (0.33, 0.55)‡ | 0.38 (0.12, 0.64)† | 0.42 (0.23, 0.60)‡ | 0.15 (0.06, 0.24)† |
|  Parkinson’s  disease  | 1.75 (1.63, 1.87)‡ | 1.79 (1.63, 1.95)‡ | 1.72 (1.53, 1.91)‡ | 1.61 (1.25, 1.97)‡ | 1.87 (1.69, 2.06)‡ | 1.66 (1.46, 1.86)‡ | 1.66 (1.09, 2.23)‡ | 2.18 (1.89, 2.47)‡ | 1.54 (1.41, 1.67)‡ |
|  Peripheral  vascular  disease | 0.03 (-0.10, 0.16) | 0.11 (-0.05, 0.27) | -0.10 (-0.31, 0.11) | -0.24 (-0.65, 0.17) | 0.01 (-0.21, 0.23) | 0.13 (-0.06, 0.31) | 0.001 (-0.44, 0.45) | -0.18 (-0.43, 0.06) | -0.03 (-0.18, 0.13) |
|  Psychiatric  conditions other  than depression  and  dementia  | -0.42 (-0.50, -0.33)‡ | -0.39 (-0.49, -0.29)‡ | -0.46 (-0.62, -0.31)‡ | -0.61 (-0.84, -0.39)‡ | -0.38 (-0.52, -0.24)‡ | -0.35 (-0.48, -0.23)‡ | -0.20 (-0.49, 0.09) | -0.65 (-0.83, -0.46)‡ | -0.39 (-0.48, -0.30)‡ |
|  Stroke | 0.46 (0.38, 0.55)‡ | 0.48 (0.37, 0.58)‡ | 0.45 (0.29, 0.60)‡ | 0.39 (0.13, 0.66)† | 0.48 (0.34, 0.63)‡ | 0.45 (0.32, 0.58)‡ | 0.56 (0.28, 0.83)‡ | 0.68 (0.49, 0.86)‡ | 0.35 (0.25, 0.44)‡  |

Legend:

**Model 1:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home; includes random intercept for long-term care homes

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001
**N/A** – Not applicable; variable not included in indicated model.

## Table S8

*Sensitivity of Model 1 Findings to Unmeasured LTCH Variables and Lack of adjustment for Long-Term Care Homes*

| **Variables**  | **Model 1** | **Model 1 with fixed effect for LTCHs** | **Model 1 with no Random Effects for LTCHs**  |
| --- | --- | --- | --- |
|  | Estimate (95% CI) | Estimate (95% CI) | Estimate (95% CI) |
| **Resident Characteristics**  |  |  |  |
| Age |  |  |  |
|  65 – 74  | Reference | Reference | Reference |
|  75 – 84 | 0.04 (-0.08, 0.17) | 0.04 (-0.09, 0.17) | 0.12 (-0.01, 0.25) |
|  85 – 94  | 0.18 (0.04, 0.31)\* | 0.17 (0.04, 0.31)\* | 0.27 (0.12, 0.42)‡  |
|  95+ | 0.61 (0.42, 0.80)‡ | 0.60 (0.42, 0.78)‡ | 0.76 (0.55, 0.97)‡ |
| Sex |  |  |  |
|  Female | Reference | Reference | Reference |
|  Male | -0.37 (-0.46, -0.28)‡ | -0.36 ( -0.45, -0.28)‡ |  -0.40 (-0.50, -0.30)‡ |
| Marital Status |  |  |  |
|  Married | Reference | Reference | Reference |
|  Widowed | -0.41 (-0.50, -0.31)‡ | -0.41 (-0.50, -0.31)‡ | -0.38 (-0.49, -0.27)‡ |
|  Never married,  separated or  divorced | -0.60 (-0.73, -0.48)‡ | -0.61 (-0.73, -0.49)‡ | -0.55 (-0.70, -0.41)‡ |
|  Missing data on  marital status | -0.64 (-0.96, -0.32)‡ | -0.64 (-0.96, -0.32)‡ | -0.64 (-1.08, -0.19)† |
| Pre-LTCH Neighborhood Income Quintile |  |  |  |
|  1 (low) | Reference | Reference | Reference |
|  2 | 0.13 (0.01, 0.26)\* | 0.13 (0.02, 0.25)\* | 0.14 (-0.02, 0.30) |
|  3 | 0.19 (0.07, 0.31)† | 0.20 (0.08, 0.31)† | 0.10 (-0.07, 0.28) |
|  4 | 0.29 (0.17, 0.41)‡ | 0.28 (0.16, 0.40)‡ | 0.30 (0.13, 0.48)† |
|  5 (high) | 0.23 (0.10, 0.37)† | 0.23 (0.11, 0.35)‡ | 0.25 (0.05, 0.45)\* |
|  Missing data  | 0.29 (0.14, 0.44)‡ | 0.29 (0.14, 0.43)‡ | 0.23 (-0.02, 0.48) |
| Days in LTC Prior to Index Date  | - |  |  |
|  0 - 4 months  | Reference | Reference | Reference |
|  > 4 months - 12  months  | -0.65 (-0.78, -0.52)‡ | -0.65 (-0.76, -0.54)‡ | -0.65 (-0.80, -0.49)‡ |
|  > 1 year - 2 years  | -0.75 (-0.89, -0.62)‡ | -0.75 (-0.86, -0.64)‡ | -0.71 (-0.87, -0.54)‡ |
|  > 2 years - 3 years  | -0.65 (-0.78, -0.51)‡ | -0.65 (-0.78, -0.52)‡ | -0.61 (-0.78, -0.44)‡ |
|  > 3 years  | -0.31 (-0.44, -0.17)‡ | -0.31 (-0.41, -0.20)‡ | -0.29 (-0.46, -0.13)‡ |
| **Prevalent Geriatric Syndromes** |  |  |  |
|  Balance  impairment | 5.69 (5.51, 5.87)‡ | 5.72 (5.62, 5.81)‡ | 5.35 (5.12, 5.59)‡ |
|  Bowel  incontinence  | 4.53 (4.38, 4.68)‡ | 4.52 (4.43, 4.61)‡ | 4.61 (4.43, 4.78)‡ |
|  Cognitive status |  |  |  |
|  Intact/borderline  | Reference | Reference | Reference |
|  Mild/moderate  impairment | 1.67 (1.55, 1.79)‡ | 1.67 (1.57, 1.77)‡ | 1.68 (1.53, 1.83)‡ |
|  Moderate-  severe/severe  impairment  | 5.27 (5.10, 5.44)‡ | 5.26 (5.14, 5.39)‡ | 5.33 (5.13, 5.53)‡ |
|  Hearing  impairment |  |  |  |
|  None | Reference | Reference | Reference |
|  Hearing  impaired | 0.03 (-0.08, 0.14) | 0.03 (-0.07, 0.14) | -0.02 (-0.14, 0.10) |
|  Missing data  | 0.66 (-0.15, 1.46) | 0.66 (-0.14, 1.46) | 0.75 (-0.18, 1.68) |
|  Body mass index  (BMI) |  |  |  |
|  BMI < 18.5 | Reference | Reference | Reference |
|  18.5 ≤ BMI ≤  25 | -0.54 (-0.68, -0.40)‡ | -0.54 (-0.67, -0.41)‡ | -0.57 (-0.71, -0.42)‡ |
|  25 < BMI <30 | -0.87 (-1.03, -0.72)‡ | -0.87 (-1.01, -0.73)‡ | -0.97 (-1.14, -0.81)‡ |
|  BMI ≥ 30 | -0.59 (-0.75, -0.43)‡ | -0.58 (-0.73, -0.44)‡ | -0.72 (-0.91, -0.53)‡ |
|  Pain |  |  |  |
|  None | Reference | Reference | Reference |
|  Less than daily  pain  | 0.29 (0.19, 0.39)‡ | 0.30 (0.21, 0.39)‡ | 0.12 (-0.02, 0.26) |
|  Daily or severe  daily pain  | 0.82 (0.70, 0.94)‡ | 0.84 (0.73, 0.94)‡ | 0.56 (0.38, 0.75)‡ |
|  Pressure ulcer | 2.67 (2.52, 2.82)‡ | 2.67 (2.52, 2.82)‡ | 2.72 (2.56, 2.88)‡ |
|  Urinary  incontinence | 4.19 (4.04, 4.35)‡ | 4.19 (4.10, 4.28)‡ | 4.22 (4.05, 4.40)‡ |
|  Visual impairment  |  |  |  |
|  None | Reference | Reference | Reference |
|  Moderate  impairment | 0.68 (0.59, 0.77)‡ | 0.68 (0.60, 0.76)‡ | 0.73 (0.62, 0.85)‡ |
|  Severe impairment  | 2.49 (2.33, 2.65)‡ | 2.50 (2.36, 2.64)‡ | 2.40 (2.22, 2.57)‡ |
| **Prevalent Chronic Conditions**  |  |  |  |
|  Arthritis  | 0.08 (-.0003, 0.15) | 0.08 (0.0003, 0.15)\* | 0.08 (-0.01, 0.17) |
|  Asthma | 0.10 (-0.04, 0.24) | 0.09 (-0.04, 0.23) | 0.20 (0.04, 0.35)\* |
|  Cancer  | -0.12 (-0.19, -0.04)† | -0.11 (-0.19, -0.03)† | -0.18 (-0.27, -0.10)‡ |
|  Chronic kidney  disease | 0.31 (0.22, 0.40)‡ | 0.31 (0.22, 0.39)‡ | 0.35 (0.24, 0.45)‡ |
|  Coronary artery  disease | -0.13 (-0.21, -0.05)† | -0.13 (-0.20, -0.05)† | -0.17 (-0.28, -0.07)**†** |
|  Chronic  obstructive  pulmonary  disease | -0.07 ( -0.17, 0.02) | -0.07 (-0.16, 0.02) | -0.09 (-0.20, 0.01) |
|  Dementia | -0.22 (-0.35, -0.10)† | -0.23 (-0.34, -0.12)‡ | -0.21 (-0.39, -0.03)\* |
|  Diabetes | -0.06 (-0.14, 0.02) | -0.06 (-0.14, 0.01) | 0.06 (-0.04, 0.16) |
|  Epilepsy  | 0.47 (0.32, 0.61)‡ | 0.47 (0.33, 0.61)‡ | 0.47 (0.32, 0.62)‡ |
|  Heart failure  | 0.36 (0.27, 0.46)‡ | 0.36 (0.27, 0.45)‡ | 0.38 (0.28, 0.49)‡ |
|  Limb paralysis or  amputation  | 1.78 (1.63, 1.93)‡ | 1.77 (1.63, 1.90)‡ | 2.00 (1.84, 2.16)‡ |
|  Mood disorder  | 0.30 (0.22, 0.38)‡ | 0.30 (0.22, 0.37)‡ | 0.35 (0.26, 0.45)‡ |
|  Parkinson’s  disease  | 1.75 (1.63, 1.87)‡ | 1.74 (1.62, 1.87)‡ | 1.82 (1.69, 1.94)‡ |
|  Peripheral  vascular  disease | 0.03 (-0.10, 0.16) | 0.04 (-0.09, 0.16) | -0.03 (-0.18, 0.12) |
|  Psychiatric  conditions other  than depression  and dementia  | -0.42 (-0.50, -0.33)‡ | -0.42 (-0.50, -0.33)‡ | -0.39 (-0.49, -0.29)‡ |
|  Stroke | 0.46 (0.38, 0.55)‡ | 0.47 (0.39, 0.55)‡ | 0.46 (0.36, 0.55)‡ |
| **Random Effects** |  |  |  |
| √ψ | 1.58  | 1.66 | N/A |
| √θ | 4.90  | 4.90 | N/A |
| **Residual Variance** | N/A | N/A | 5.16  |
| **Derived Estimates** |  |  |  |
| R2 | 0.627 | 0.624 | 0.626 |
| ρ | 0.095 | 0.103 | N/A |

Legend:

**Model 1:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home; includes random intercept for long-term care homes

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001
***√ψ***: Square root of between-long-term care home variance

***√θ***: Square root of within-long-term care home variance

The **null model** of disability containing only random LTCH intercepts and no explanatory resident or LTCH variables had a within-LTCH variance of 66.91 and a between-LTCH variance of 4.16; variances from all multivariable models were compared to these values to estimate proportion of variance explained (*R2*).
***R2***: The proportional reduction in the estimated total residual variance compared to the null model (Model 1)

**ρ**:Proportion of variance that is explained by LTCH characteristics = ψ/(ψ+θ)

## Table S9

*Sensitivity of Model 1 Findings to Coding of Chronic Conditions*

| **Variables**  | **Model 1** | **Model 1 with Chronic Conditions Coded Using Health Administrative Claims Only**  | **Model 1 with Chronic Conditions Coded Using RAI-MDS Data Only** |
| --- | --- | --- | --- |
|  | Estimate (95% CI) | Estimate (95% CI) | Estimate (95% CI) |
| **Resident Characteristics**  |  |  |  |
| Age |  |  |  |
|  65 – 74  | Reference | Reference | Reference |
|  75 – 84 | 0.04 (-0.08, 0.17) | -0.07 (-0.19, 0.05) | 0.08 (-0.04, 0.21) |
|  85 – 94  | 0.18 (0.04, 0.31)\* | -0.01 (-0.15, 0.12) | 0.23 (0.09, 0.36)† |
|  95+ | 0.61 (0.42, 0.80)‡ | 0.36 (0.17, 0.54)‡ | 0.64 (0.46, 0.83)‡ |
| Sex |  |  |  |
|  Female | Reference | Reference | Reference |
|  Male | -0.37 (-0.46, -0.28)‡ |  -0.32 (-0.41, -0.23)‡ | -0.37 (-0.46, -0.28)‡ |
| Marital Status |  |  |  |
|  Married | Reference | Reference | Reference |
|  Widowed | -0.41 (-0.50, -0.31)‡ | -0.42 (-0.51, -0.32)‡ | -0.41 (-0.51, -0.32)‡ |
|  Never married,  separated or  divorced | -0.60 (-0.73, -0.48)‡ | -0.63 (-0.75, -0.50)‡ | -0.63 (-0.76, -0.51)‡ |
|  Missing data on  marital status | -0.64 (-0.96, -0.32)‡ | -0.67 (-1.00, -0.35)‡ | -0.67 (-0.99, -0.34)‡ |
| Pre-LTCH Neighborhood Income Quintile |  |  |  |
|  1 (low) | Reference | Reference | Reference |
|  2 | 0.13 (0.01, 0.26)\* | 0.14 (0.01, 0.26)\* | 0.15 (0.02, 0.27)\* |
|  3 | 0.19 (0.07, 0.31)† | 0.20 (0.08, 0.32)† | 0.20 (0.09, 0.32)† |
|  4 | 0.29 (0.17, 0.41)‡ | 0.30 (0.17, 0.42)‡ | 0.30 (0.18, 0.42)‡ |
|  5 (high) | 0.23 (0.10, 0.37)† | 0.25 (0.11, 0.38)‡ | 0.24 (0.11, 0.38)‡ |
|  Missing data  | 0.29 (0.14, 0.44)‡ | 0.32 (0.17, 0.47)‡ | 0.30 (0.15, 0.46)‡ |
| Days in LTC Prior to Index Date  | - |  |  |
|  0 - 4 months  | Reference | Reference | Reference |
|  > 4 months - 12  months  | -0.65 (-0.78, -0.52)‡ | -0.60 (-0.73, -0.47)‡ | -0.65 (-0.78, -0.52)‡ |
|  > 1 year - 2 years  | -0.75 (-0.89, -0.62)‡ | -0.69 (-0.82, -0.55)‡ | -0.78 (-0.91, -0.64)‡ |
|  > 2 years - 3 years  | -0.65 (-0.78, -0.51)‡ | -0.57 (-0.71, -0.43)‡ | -0.68 (-0.82, -0.54)‡ |
|  > 3 years  | -0.31 (-0.44, -0.17)‡ | -0.13 (-0.27, 0.005) | -0.36 (-0.50, -0.23)‡ |
| **Prevalent Geriatric Syndromes** |  |  |  |
|  Balance impairment | 5.69 (5.51, 5.87)‡ | 5.83 (5.65, 6.01)‡ | 5.70 (5.51, 5.88)‡ |
|  Bowel incontinence  | 4.53 (4.38, 4.68)‡ | 4.60 (4.44, 4.75)‡ | 4.55 (4.40, 4.71)‡ |
|  Cognitive status |  |  |  |
|  Intact/borderline  | Reference | Reference | Reference |
|  Mild/moderate  impairment | 1.67 (1.55, 1.79)‡ | 1.64 (1.52, 1.76)‡ | 1.77 (1.64, 1.89)‡ |
|  Moderate-  severe/severe  impairment  | 5.27 (5.10, 5.44)‡ | 5.20 (5.03, 5.37)‡ | 5.41 (5.23, 5.58)‡ |
|  Hearing impairment |  |  |  |
|  None | Reference | Reference | Reference |
|  Hearing impaired | 0.03 (-0.08, 0.14) | 0.007 (-0.10, 0.12) | 0.02 (-0.08, 0.13) |
|  Missing data  | 0.66 (-0.15, 1.46) | 0.60 (-0.20, 1.40) | 0.70 (-0.12, 1.51) |
|  Body mass index  (BMI) |  |  |  |
|  BMI < 18.5 | Reference | Reference | Reference |
|  18.5 ≤ BMI ≤  25 | -0.54 (-0.68, -0.40)‡ | -0.53 (-0.67, -0.39)‡ | -0.53 (-0.67, -0.39)‡ |
|  25 < BMI <30 | -0.87 (-1.03, -0.72)‡ | -0.84 (-0.99, -0.69)‡ | -0.86 (-1.01, -0.71)‡ |
|  BMI ≥ 30 | -0.59 (-0.75, -0.43)‡ | -0.56 (-0.72, -0.40)‡ | -0.58 (-0.74, -0.42)‡ |
|  Pain |  |  |  |
|  None | Reference | Reference | Reference |
|  Less than daily  pain  | 0.29 (0.19, 0.39)‡ | 0.31 (0.21, 0.41)‡ | 0.28 (0.18, 0.37)‡ |
|  Daily or severe  daily pain  | 0.82 (0.70, 0.94)‡ | 0.84 (0.72, 0.97)‡ | 0.79 (0.67, 0.91)‡ |
|  Pressure ulcer | 2.67 (2.52, 2.82)‡ | 2.75 (2.60, 2.90)‡ | 2.67 (2.52, 2.82)‡ |
|  Urinary  incontinence | 4.19 (4.04, 4.35)‡ | 4.23 (4.07, 4.39)‡ | 4.21 (4.05, 4.37)‡ |
|  Visual impairment  |  |  |  |
|  None | Reference | Reference | Reference |
|  Moderate  impairment | 0.68 (0.59, 0.77)‡ | 0.70 (0.61, 0.78)‡ | 0.68 (0.59, 0.77)‡ |
|  Severe impairment  | 2.49 (2.33, 2.65)‡ | 2.48 (2.32, 2.64)‡ | 2.49 (2.32, 2.64)‡ |
| **Prevalent Chronic Conditions**  |  |  |  |
|  Arthritis  | 0.08 (-.0003, 0.15) | 0.05 (-0.03, 0.12) | 0.10 (0.02, 0.17)\* |
|  Asthma | 0.10 (-0.04, 0.24) | 0.06 (-0.12, 0.24) | 0.10 (-0.07, 0.28) |
|  Cancer  | -0.12 (-0.19, -0.04)† | -0.14 (-0.22, -0.05)† | -0.02 (-0.13, 0.09) |
|  Chronic kidney  disease | 0.31 (0.22, 0.40)‡ | 0.36 (0.26, 0.46)‡ | 0.23 (0.11, 0.35)‡ |
|  Coronary artery  disease | -0.13 (-0.21, -0.05)† | -0.08 (-0.17, 0.0008) | -0.11 (-0.21, -0.01)\* |
|  Chronic  obstructive  pulmonary  disease | -0.07 ( -0.17, 0.02) | 0.02 (-0.09, 0.13) | -0.07 (-0.17, 0.03) |
|  Dementia | -0.22 (-0.35, -0.10)† | -0.21 (-0.33, -0.10)‡ | -0.40 (-0.50, -0.30)‡ |
|  Diabetes | -0.06 (-0.14, 0.02) | -0.01 (-0.10, 0.07) | -0.02 (-0.10, 0.06) |
|  Epilepsy  | 0.47 (0.32, 0.61)‡ | 0.38 (0.19, 0.57)‡ | 0.55 (0.38, 0.71)‡ |
|  Heart failure  | 0.36 (0.27, 0.46)‡ | 0.36 (0.27, 0.46)‡ | 0.29 (0.17, 0.40)‡ |
|  Limb paralysis or  amputation  | 1.78 (1.63, 1.93)‡ | -0.07 (-0.21, 0.06) | 1.75 (1.60, 1.91)‡ |
|  Mood disorder  | 0.30 (0.22, 0.38)‡ | -0.02 (-0.12, 0.09) | 0.31 (0.23, 0.39)‡ |
|  Parkinson’s  disease  | 1.75 (1.63, 1.87)‡ | 1.75 (1.61, 1.88)‡ | 1.82 (1.69, 1.95)‡ |
|  Peripheral  vascular  disease | 0.03 (-0.10, 0.16) | -0.11 (-0.33, 0.11) | 0.08 (-0.06, 0.23) |
|  Psychiatric  conditions other  than depression  and dementia  | -0.42 (-0.50, -0.33)‡ | -0.39 (-0.49, -0.29)‡ | -0.45 (-0.57, -0.33)‡ |
|  Stroke | 0.46 (0.38, 0.55)‡ | 0.98 (0.88, 1.07)‡ | 0.40 (0.31, 0.49)‡ |
| **Random Effects** |  |  |  |
| √ψ | 1.58  | 1.61 | 1.59 |
| √θ | 4.90  | 4.93 | 4.90 |
| **Derived Estimates** |  |  |  |
| R2 | 0.627 | 0.622 | 0.626 |
| ρ | 0.095 | 0.053 | 0.095 |

Legend:

**Model 1:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home; includes random intercept for long-term care homes

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001
***√ψ***: Square root of between-long-term care home variance

***√θ***: Square root of within-long-term care home variance

The **null model** of disability containing only random LTCH intercepts and no explanatory resident or LTCH variables had a within-LTCH variance of 66.91 and a between-LTCH variance of 4.16; variances from all multivariable models were compared to these values to estimate proportion of variance explained (*R2*).
***R2***: The proportional reduction in the estimated total residual variance compared to the null model (Model 1)

**ρ**:Proportion of variance that is explained by LTCH characteristics = ψ/(ψ+θ)

## Table S10

*Sensitivity of Model 2 Findings to Exclusion of Admission Assessments*

|  | **Model 2**||(n =77, 165) | **Model 2 in Sample Excluding Admission Assessments**(n = 67,863) |
| --- | --- | --- |
|   | Estimate (95% CI) | Estimate (95% CI) |
| Constant  | 2.70 (2.18, 3.22)‡ | 2.65 (2.10, 3.20) |
| **Resident Characteristics** |  |  |
| Age |  |  |
|  65 – 74  | Reference | Reference |
|  75 – 84 | 0.04 (-0.08, 0.16) | 0.03 (-0.10, 0.16) |
|  85 – 94  | 0.18 (0.04, 0.31)\* | 0.15 (0.01, 0.29)\* |
|  95+ | 0.61 (0.42, 0.79)‡ | 0.60 (0.41, 0.80)‡ |
| Sex |  |  |
|  Female | Reference | Reference |
|  Male | -0.36 (-0.46, -0.27)‡ | -0.36 (-0.46, -0.27)‡ |
| Marital Status |  |  |
|  Married | Reference | Reference |
|  Widowed | -0.41 (-0.50, -0.31)‡ | -0.43 (-0.53, -0.33)‡ |
|  Never married, separated or  divorced | -0.60 (-0.73, -0.48)‡ | -0.60 (-0.73, -0.47)‡ |
|  Missing data on marital status | -0.64 (-0.97, -0.32)‡ | -0.60 (-0.94, -0.25)† |
| Pre-LTCH Neighborhood Income Quintile |  |  |
|  1 (low) | Reference | Reference |
|  2 | 0.12 (0.002, 0.25)\* | 0.08 (-0.04, 0.21) |
|  3 | 0.18 (0.06, 0.30)† | 0.17 (0.05, 0.29)† |
|  4 | 0.27 (0.15, 0.39)‡ | 0.29 (0.16, 0.41)‡ |
|  5 (high) | 0.23 (0.09, 0.36)† | 0.19 (0.05, 0.34)† |
|  Missing data  | 0.28 (0.13, 0.43)‡ | 0.25 (0.10, 0.40)† |
| Days in LTCH Prior to Index Date  | - |  |
|  0 - 4 months  | Reference | Reference |
|  > 4 months - 12 months  | -0.65 (-0.78, -0.52)‡ | -0.69 (-0.84, -0.55)‡ |
|  > 1 year - 2 years  | -0.76 (-0.89, -0.62)‡ | -0.82 (-0.97, -0.67)‡ |
|  > 2 years - 3 years  | -0.65 (-0.78, -0.51)‡ | -0.72 (-0.88, -0.57)‡ |
|  > 3 years  | -0.30 (-0.44, -0.17)‡ | -0.41 (-0.55, -0.27)‡ |
| **Prevalent Geriatric Syndromes** |  |  |
|  Balance impairment | 5.66 (5.48, 5.84)‡ | 5.67 (5.48, 5.86)‡ |
|  Bowel incontinence  | 4.52 (4.37, 4.67)‡ | 4.57 (4.41, 4.73)‡ |
|  Cognitive status |  |  |
|  Intact/borderline  | Reference | Reference |
|  Mild/moderate impairment | 1.66 (1.54, 1.78)‡ | 1.80 (1.66, 1.93)‡ |
|  Moderate-severe/severe  impairment  | 5.26 (5.09, 5.43)‡ | 5.42 (5.24, 5.60)‡ |
|  Hearing impairment |  |  |
|  None | Reference | Reference |
|  Hearing impaired | 0.03 (-0.08, 0.13) | -0.02 (-0.13, 0.10) |
|  Missing data  | 0.67 (-0.11, 1.46) | 0.61 (-0.19, 1.41) |
|  Body mass index (BMI) |  |  |
|  BMI < 18.5 | Reference | Reference |
|  18.5 ≤ BMI ≤ 25 | -0.54 (-0.68, -0.40)‡ | -0.59 (-0.74, -0.45)‡ |
|  25 < BMI <30 | -0.88 (-1.03, -0.72)‡ | -0.88 (-1.04, -0.72)‡ |
|  BMI ≥ 30 | -0.60 (-0.76, -0.44)‡ | -0.62 (-0.79, -0.45)‡ |
|  Pain |  |  |
|  None | Reference | Reference |
|  Less than daily pain  | 0.29 (0.19, 0.39)‡ | 0.26 (0.16, 0.37)‡ |
|  Daily or severe daily pain  | 0.83 (0.70, 0.95)‡ | 0.75 (0.62, 0.88)‡ |
|  Pressure ulcer | 2.67 (2.52, 2.82)‡ | 2.59 (2.44, 2.75)‡ |
|  Urinary incontinence | 4.20 (4.04, 4.35)‡ | 4.39 (4.22, 4.55)‡ |
|  Visual impairment  |  |  |
|  None | Reference | Reference |
|  Moderate impairment | 0.68 (0.59, 0.76)‡ | 0.64 (0.52, 0.73)‡ |
|  Severe impairment  | 2.49 (2.33, 2.65)‡ | 2.47 (2.31, 2.63)‡ |
| **Prevalent Chronic Conditions**  |  |  |
|  Arthritis  | 0.08 (0.0003, 0.15)\* | 0.07 (-0.01, 0.15) |
|  Asthma | 0.10 (-0.04, 0.24) | 0.12 (-0.03, 0.26) |
|  Cancer  | -0.12 (-0.19, -0.04)† | -0.12 (-0.20, -0.03)† |
|  Coronary artery disease | -0.13 (-0.21, -0.05)† | -0.14 (-0.23, -0.06)† |
|  Chronic obstructive pulmonary  disease | -0.07 (-0.17, 0.02) | -0.09 (-0.19, 0.01) |
|  Dementia | -0.23 (-0.36, -0.11)‡ | -0.17 (-0.31, -0.04)† |
|  Diabetes | -0.06 (-0.14, 0.02) | -0.06 (-0.14, 0.02) |
|  Epilepsy  | 0.47 (0.33, 0.62)‡ | 0.48 (0.33, 0.63)‡ |
|  Heart failure  | 0.36 (0.27, 0.45)‡ | 0.35 (0.25, 0.44)‡ |
|  Kidney disease | 0.31 (0.22, 0.40)‡ | 0.25 (0.15, 0.35)‡ |
|  Limb paralysis or amputation  | 1.77 (1.62, 1.92)‡ | 1.75 (1.60, 1.91)‡ |
|  Mood disorder  | 0.30 (0.22, 0.38)‡ | 0.27 (0.19, 0.35)‡ |
|  Parkinson’s disease  | 1.75 (1.63, 1.87)‡ | 1.71 (1.58, 1.84)‡ |
|  Peripheral vascular disease | 0.03 (-0.10, 0.16) | 0.05 (-0.09, 0.19) |
|  Psychiatric conditions other  than depression and dementia  | -0.42 (-0.50, -0.33)‡ | -0.42 (-0.51, -0.33)‡ |
|  Stroke | 0.46 (0.38, 0.55)‡ | 0.43 (0.34, 0.52)‡ |
| LTCH Size |  |  |
|  Small (≤64) | Reference | Reference |
|  Medium (65 – 128) | -0.05 (-0.32, 0.21) | -0.04 (-0.31, 0.23) |
|  Large (129 – 192) | 0.08 (-0.24, 0.40) | 0.10 (-0.22, 0.42) |
|  Extra-large ( ≥193)  | 0.25 (-0.13, 0.63) | 0.25 (-0.13, 0.64) |
| Ownership Status  |  |  |
|  Not-for-profit | Reference | Reference |
|  For-profit | 0.23 (0.006, 0.46)\* | 0.16 (-0.06, 0.39) |
|  Missing data  | 0.44 (-0.47, 1.35) | 0.22 (-0.81, 1.26) |
| LTCH Location |  |  |
|  Rural | Reference | Reference |
|  Sub-urban | 0.14 (-0.22, 0.49) | 0.21 (-0.16, 0.57) |
|  Urban | -0.12 ( -0.41, 0.15) | -0.11 (-0.39, 0.18) |
| Mean % residents received physio- or occupational therapy (Quartiles) |  |  |
|  Lowest quartile | Reference | Reference |
|  2nd quartile  | 0.17 (-0.13, 0.47) | 0.01 (-0.30, 0.33) |
|  3rd quartile  | 0.14 (-0.17, 0.45) | -0.22 (-0.53, 0.10) |
|  Highest quartile | -0.05 (-0.35, 0.24) | -0.12 (-0.42, 0.19) |
| Mean % residents restrained (Quartiles) |  |  |
|  Lowest quartile | Reference | Reference |
|  2nd quartile  | 0.007 (-0.30, 0.32) | 0.21 (-0.10, 0.51) |
|  3rd quartile  | -0.23 (-0.54, 0.07) | 0.17 (-0.14, 0.48) |
|  Highest quartile | -0.14 (-0.45, 0.16) | -0.04 (-0.34, 0.25) |
| Median Resident ADL in each home (Quartiles) |  |  |
|  Lowest quartile | Reference | Reference |
|  2nd quartile  | 1.16 (0.87, 1.46) ‡ | 1.07 (0.78, 1.37)‡ |
|  3rd quartile  | 1.62 (1.30, 1.94) ‡ | 1.54 (1.22, 1.86)‡ |
| Highest quartile  | 2.81 (2.50, 3.11) ‡ | 2.72 ( 2.41, 3.03)‡ |
| **Random Effects** |  |  |
| √ψ | 1.21 (1.13, 1.28) | 1.21 (1.13, 1.29) |
| √θ | 4.90 (4.84, 4.96) | 4.86 (4.80, 4.92) |
| **Derived Estimates** |  |  |
| R2 | 0.642 | 0.647 |
| ρ | 0.057 | 0.058 |

Legend:

**Model 2:** Adjusted for resident age, sex, marital status, pre-admission neighborhood income quintile, number of days since admission to long-term care home, as well as the following long-term care home variables: size, ownership type, location, proportion of residents who recently received physiotherapy or occupation therapy, proportion of residents restrained, and median resident disability. Also a random intercept for long-term care homes.

**Reference**: Variable category is the reference group for all other categories within that variable.

**\***p-value <0.05
**†**p-value <0.01

**‡**p-value <0.0001
***√ψ***: Square root of between-long-term care home variance

***√θ***: Square root of within-long-term care home variance

The **null model** of disability containing only random LTCH intercepts and no explanatory resident or LTCH variables had a within-LTCH variance of 66.91 and a between-LTCH variance of 4.16; variances from all multivariable models were compared to these values to estimate proportion of variance explained (*R2*).
***R2***: The proportional reduction in the estimated total residual variance compared to the null model (Model 1)

**ρ**:Proportion of variance that is explained by LTCH characteristics = ψ/(ψ+θ)

References

1. Verbrugge LM, Jette AM: The disablement process. Soc Sci Med1994, **38**(1):1-14.