

The Influence of Primary Care, Specialist, and Home Care Services Utilization on Emergency Department Use Among Home Care Clients



ANDREW COSTA^{1,2}, CHRISTINA DIONG², CHAIM BELL^{2,3,4},
WALTER WODCHIS^{2,3}, SAMIR SINHA^{3,4} AND SUSAN BRONSKILL^{2,3}

1. DEPT. OF CLINICAL EPIDEMIOLOGY & BIOSTATISTICS, MCMASTER UNIVERSITY
2. INSTITUTE FOR CLINICAL EVALUATIVE SCIENCES
3. INSTITUTE OF HEALTH POLICY, MANAGEMENT AND EVALUATION, UNIVERSITY OF TORONTO
4. MOUNT SINAI HOSPITAL

This is Andrew Costa



Disclosures

None!

Acknowledgements

This research was funded by:

- Canadian Institutes of Health Research
- Ontario Ministry of Health and Long-Term Care (Public reporting on seniors' health and service expansion impact - #04601AC)
- Health System Performance Research Network

Context

Previous Canadian research has demonstrated the influence of primary care on older adults' use of the ED

(Haggarty, 2007; Ionescu-Iltu, 2007; McCusker 2010, 2012)

Home care clients represent an important frail subgroup of older adults

- Prevalence: ~ 9% of population age 65+; ~ 32% age 85+ (Ontario Estimates)
- At very high risk for ED use relative to LTC residents and others (Wilson and Truman; 2005)

Need-level risk of ED has been delineated among home care clients

- DIVERT Scale (Costa, 2015)

Little population-level research has examined the influence of service utilization on ED use in home care

Objectives

Main Question:

What is the influence of primary care, specialist, and home care services utilization on ED use among new home care clients after adjusting for person-level risk factors?

Hypotheses:

- Controlling for risk, primary care and specialist care use will have a protective influence on ED use.
- Only home care nursing services will have an protective influence on ED use.

Methodology

Design: Retrospective cohort study

Setting: Publicly funded home care in Ontario

- i.e., Community Care Access Centres (CCACs)

Population:

- Prevalence cohort of community-dwelling home care clients with an assessment between April 1st, 2011 and Sept. 30, 2012
- Inclusions: Age 66+ years, admitted long-stay clients, community dwelling / non institutional
- N=130,749

Analyses: Cox proportional hazards regression with baseline and time dependent covariates

Outcome

Emergency Department Visits

Time to first unplanned ED visit

- *Excludes:* Planned visits & transfers
- Source: National Ambulatory Care Reporting System

Censoring

- 6 months following RAI HC assessment (index)
- Other:
 - Institutional admission (Sources: CIHI-CCRS, CIHI-DAD, OMHRS)
 - Discharge - Death or Vacation > 30 days (OACCAC HCD)

Time Dependent Covariates / Exposures

Physician Visits (Source: OHIP/IPDB)

- Cumulative visits during risk period
 1. Primary Care: ‘office’ or ‘home’ based
 2. Geriatrician
 3. Cardiologist

Home Care Services (Source: HCD)

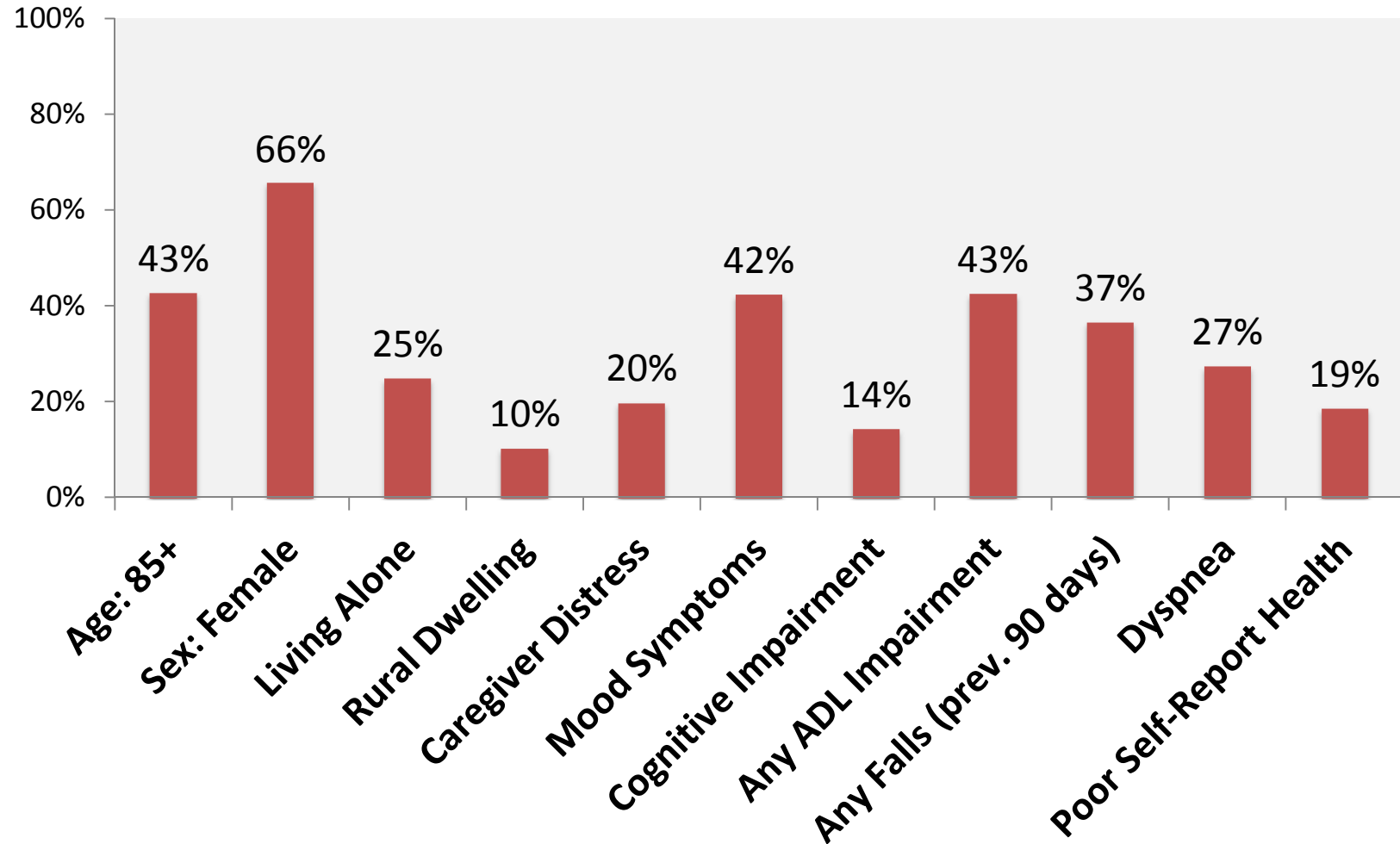
- Cumulative services during risk period
 1. Nursing (clinic or in home)
 2. Personal and/or homemaking
 3. Therapy (PT, OT, SLP)

Baseline Confounders/Modifiers

1. Age (RAI-HC)
2. Gender (RAI-HC)
3. Living arrangement (RAI-HC, RPDB)
 - Alone, rurality
4. Income (RPDB/PCCF)
5. Informal Caregiver Status (RAI-HC)
 - No helper, caregiver distress
6. Nursing indications (RAI-HC)
 - oxygen, IV, injections, wounds, catheter use
7. Primary care usual provider index (OHIP)
8. DIVERT Scale (ED Risk, RAI-HC)*

*The DIVERT Scale (2015). JAGS, 63(4) 763–769.

Results – Selected Characteristics



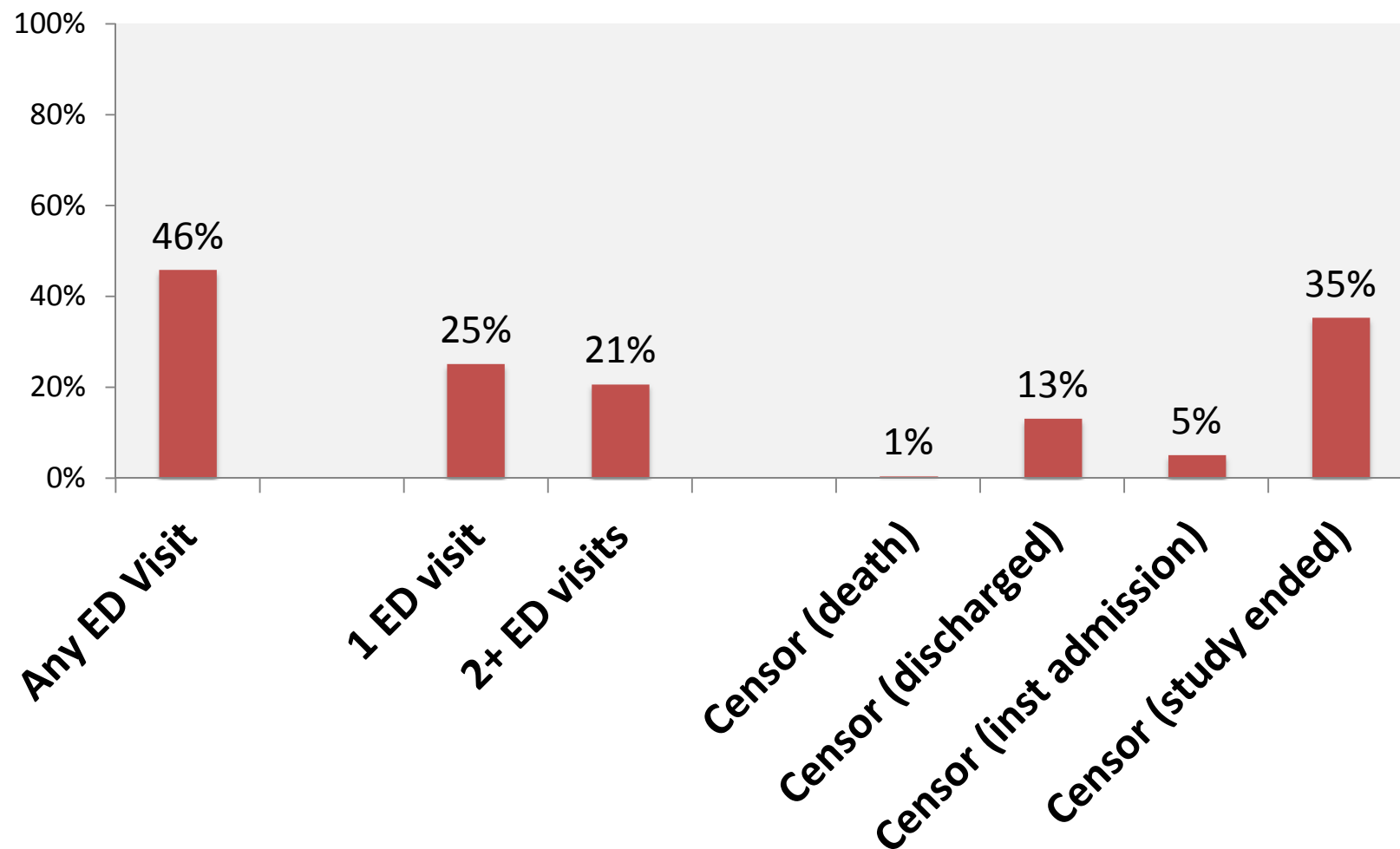
Physician Utilization (Cumulative)

		Baseline (Previous Year)	Observation Period
Primary Care	None	8,024 (6.1%)	37,988 (29.1%)
	1-4 visit	43,039 (32.9%)	74,509 (57.0%)
	> 4 visit	79,686 (60.9%)	18,252 (14.0%)
Usual Provider of Care Index	None	10,900 (8.3%)	-
	High (≥ 0.75)	91,191 (69.7%)	-
	Low (< 0.75)	28,658 (21.9%)	-
Cardiology	None	106,471 (81.4%)	121,160 (92.7%)
	1-4 visit	22,434 (17.2%)	9,393 (7.2%)
	> 4 visit	1,844 (1.4%)	196 (0.1%)
Geriatrics	None	117,511 (89.9%)	124,563 (95.3%)
	1-4 visit	12,698 (9.7%)	6,133 (4.7%)
	> 4 visit	540 (0.4%)	53 (0.0%)

Home Care Utilization (Cumulative)

		Observation Period
Nursing (hours/visits)	0	96,321 (73.7%)
	0.1 to <20	25,096 (19.2%)
	20 to <40	5,027 (3.8%)
	40+	4,305 (3.3%)
Therapy (hours)	0	88,973 (68.0%)
	0.1 to <20	41,636 (31.8%)
	20 to <40	128 (0.1%)
	40+	12 (0.0%)
PSW (hours)	0	38,665 (29.6%)
	0.1 to <20	29,596 (22.6%)
	20 to <40	18,747 (14.3%)
	40+	43,741 (33.5%)

Outcomes (index to ED visit or censor)



Cox Model

		Hazards Ratio (95% CI)	p-value
Age	65-		
74(ref)		1	
75-84		0.99 (0.97, 1.02)	0.6006
85+		1.04 (1.01, 1.06)	0.0074
Gender: Female (Male = ref)		0.88 (0.87, 0.90)	<.0001
Living alone (Not living alone = ref)		0.97 (0.94, 0.99)	0.0027
Rurality			
Major Urban		1	
Urban		1.34 (1.31, 1.38)	<.0001
Rural		1.20 (1.17, 1.22)	<.0001
Low income (Med. & High = ref)		1.02 (1.01, 1.04)	0.005
Caregiver express distress		1.15 (1.12, 1.17)	<.0001
UPC Index: High (UPC<0.75 = ref)		0.92 (0.91, 0.94)	<.0001

Cox Model (cont.)

	Hazards Ratio (95% CI)	p-value
Oxygen Therapy	1.21 (1.17, 1.25)	<.0001
IV Therapy	1.34 (1.26, 1.41)	<.0001
Medication Injection	1.07 (1.04, 1.10)	<.0001
Wound Care	1.20 (1.17, 1.24)	<.0001
Catheter Care	1.37 (1.30, 1.44)	<.0001
DIVERT Scale		
1(ref)	1	
2	1.25 (1.21, 1.29)	<.0001
3	1.53 (1.48, 1.58)	<.0001
4	1.84 (1.78, 1.90)	<.0001
5	2.24 (2.16, 2.31)	<.0001
6	2.92 (2.81, 3.03)	<.0001

Cox Model (cont.)

	Hazards Ratio (95% CI)	p-value
Primary Care visits		
GP/FP Visits	1.05 (1.04, 1.05)	<.0001
Specialist visits		
Cardiologist	1.07 (1.05, 1.09)	<.0001
Geriatrics	1.04 (1.01, 1.08)	0.0129
Home Care hours/visits		
Nursing	1.00 (1.00, 1.00)	<.0001
Personal/Homemaking	1.00 (1.00, 1.00)	<.0001
Therapy	1.01 (1.01, 1.02)	<.0001

Cox Model ('dose' sensitivity)

	<u>per 5 visits</u>		<u>per 10 visits</u>	
	HR (95% CI)	p-value	HR (95% CI)	p-value
Primary Care visits				
GP/FP Visits	1.25 (1.23, 1.27)	<.0001	1.57 (1.52, 1.62)	<.0001
Specialist visits				
Cardiologist	1.43 (1.30, 1.57)	<.0001	2.05 (1.68, 2.47)	<.0001
Geriatrics	1.23 (1.04, 1.45)	0.0129	1.52 (1.09, 2.10)	0.0129
Home Care hours/visits				
Nursing	1.01 (1.00, 1.01)	<.0001	1.01 (1.01, 1.02)	<.0001
Personal/Homemaking	1.00 (1.00, 1.00)	<.0001	0.99 (0.99, 0.99)	<.0001
Therapy	1.07 (1.05, 1.10)	<.0001	1.16 (1.11, 1.21)	<.0001

Discussion

Large population-level study with relatively detailed information on confounders.

- Cohort design with time-to-event analyses reduced bias (e.g., survivor effect)

We validated previous Canadian findings based on seniors:

- Protective effect of greater primary care continuity (Ionescu-Ittu, 2007; McCusker 2012)
- Increase ED risk among rural residents (Haggerty, 2007; McCusker 2010)

Discussion (cont.)

Controlling for potential confounders, increased primary care and specialist care use was positively associated with ED use.

- Association was fairly weak, but proportional to cumulative utilization/'dose'
- May reflect lack of effective prevention for home care clients
 - i.e., they have more complicated health issues.
- Similar result to Quebec study on primary care access (inc. access = inc. ED use) (Ionescu-Ittu, 2007)

Discussion (cont.)

Controlling for potential confounders, increased home care service use was not associated with ED use.

- Suggests that services are not effective at preventing ED use, or that service provision is not driven by risk of ED use.
 - In Ontario, home care service provision is driven by risk of LTC (nursing home) admission, and is not associated with risk of ED use.

Main limitations

Underlying risk for ED use may not be adequately explained by the baseline model.

- Risk estimates for provider utilization may reflect some unmeasured risk rather than the influence (or lack) of each provider service.
- Subgroup analyses are needed to reduce the potential confounding by unmeasured risk.
 - E.g., ‘ambulatory-care sensitive’, clinical subgroups, clients at very high risk, etc.

Conclusion

Preliminary analyses suggest that increased use of primary care, specialist, and home care services do not prevent ED use among home care clients.

Investments in primary care, specialist, and home care services without a focus on quality improvement may not reduce ED use.

- New investments should be based on proven benefits based on experimental or quasi-experimental; evidence.



Questions? ...Comments?

Email: acosta@mcmaster.ca

Twitter: @andrew_p_costa