Do multidisciplinary primary care teams impact health care utilization and costs for patients with multiple chronic conditions?
Evidence from Quebec's Family Medicine Groups

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Chronic Disease and Multimorbidity

- Multimorbidity : co-occurrence of multiple chronic medical conditions (two or more) in the same individual

  - Medical conditions that require care over a period of several months, or years, and that evolve slowly (WHO)

  - Age-standardized prevalence of ≥ 2 diseases, age 25+ (Fortin et al. 2010):
    - 11.6% in Quebec's general population
    - 32.3% among patients in family practice clinics

- Measurement of multimorbidity

  - Our definition : 2 or more conditions identified

  - Number of chronic conditions (ex. Elixhauser Comorbidity Index)

  - Number of chronic conditions + weighting by gravity or health services use and related costs (ex. Charlson Comorbidity Index)

Chronic Conditions Identified

Cardiometabolic Conditions	Other Conditions
• Diabetes • Hypertension • Cardiac insufficiency • Ischemic Cardiopathy • Hyperlipidemia	• Arthritis • Asthma & Chronic obstructive pulmonary disease (COPD) • Anxiety & Depressive Disorders • Schizophrenia

"Integrated primary care" models

- **Team-centered approaches based on:**

  - Multidisciplinary teams of health professionals (physicians, nurses, dieticians, etc)

  - Patients enrolling with a specific group of physicians for a fixed time period (rostering)

  - Access to a comprehensive range of primary care services for enrolled patients outside of regular office hours

  - Specialist referrals by primary care physicians

  - Physician payment methods that blend elements of capitation and fee-for-service, sometimes pay-for-performance

  - Integration of health promotion and illness prevention strategies

  - Integration of electronic medical records

Quebec's Family Medicine Groups (FMG)

- Goal is to enhance access and coordination of care for registered patients

- 6-12 full-time equivalent physicians, working in close collaboration with nurses and other health professionals (e.g., social workers, nutritionists, and pharmacists)

- 1,000-2,200 registered patients per FTE physician

- As of March 2013, there were 253 groups across the province employing 3,996 family physicians (58%) and covering 3,139,138 patients (39%) (MSSS 2013)

- Our study includes "first generation" FMGs

  – 79 FMGs across 16 health regions, registered between Nov 2002 and July 2004

Quebec's Family Medicine Groups (FMG)

- Nurses play a key role: interviews and screening, patient follow-up, patient education, and disease prevention and health promotion activities

- GMFs contract with regional health boards, agreeing to provide increased services (e.g., extended-hours access) in exchange for additional public funding (for computer equipment and salaries for nurses and administrative assistants) (Pomey et al 2009)

- Physicians maintain the same remuneration policy (i.e., fee-for-service) as non-GMF physicians; no pay-for-performance component

  - Small additional fixed payments ($7/year per registered patient and $52/eight hour block for after-hours availability)

Potential impacts of FMGs among patients with multimorbidity

- Our previous findings among chronically ill and elderly patients :
  - FMGs reduced GP visits and related costs by 2% annually
  - FMGs reduced specialist visits by 0.7% and related costs by 1% annually

- Intended role for nurses suggests that benefits of FMGs may be concentrated among patients with multiple chronic conditions

- We evaluated the impacts of FMGs on the policy-relevant outcomes of health care service use and costs among patients with multimorbidity vs. without multimorbidity

- We hypothesized that FMGs would have a larger impact on increasing use of primary care services and decreasing specialist, ED, and hospital services among patients with multimorbidity
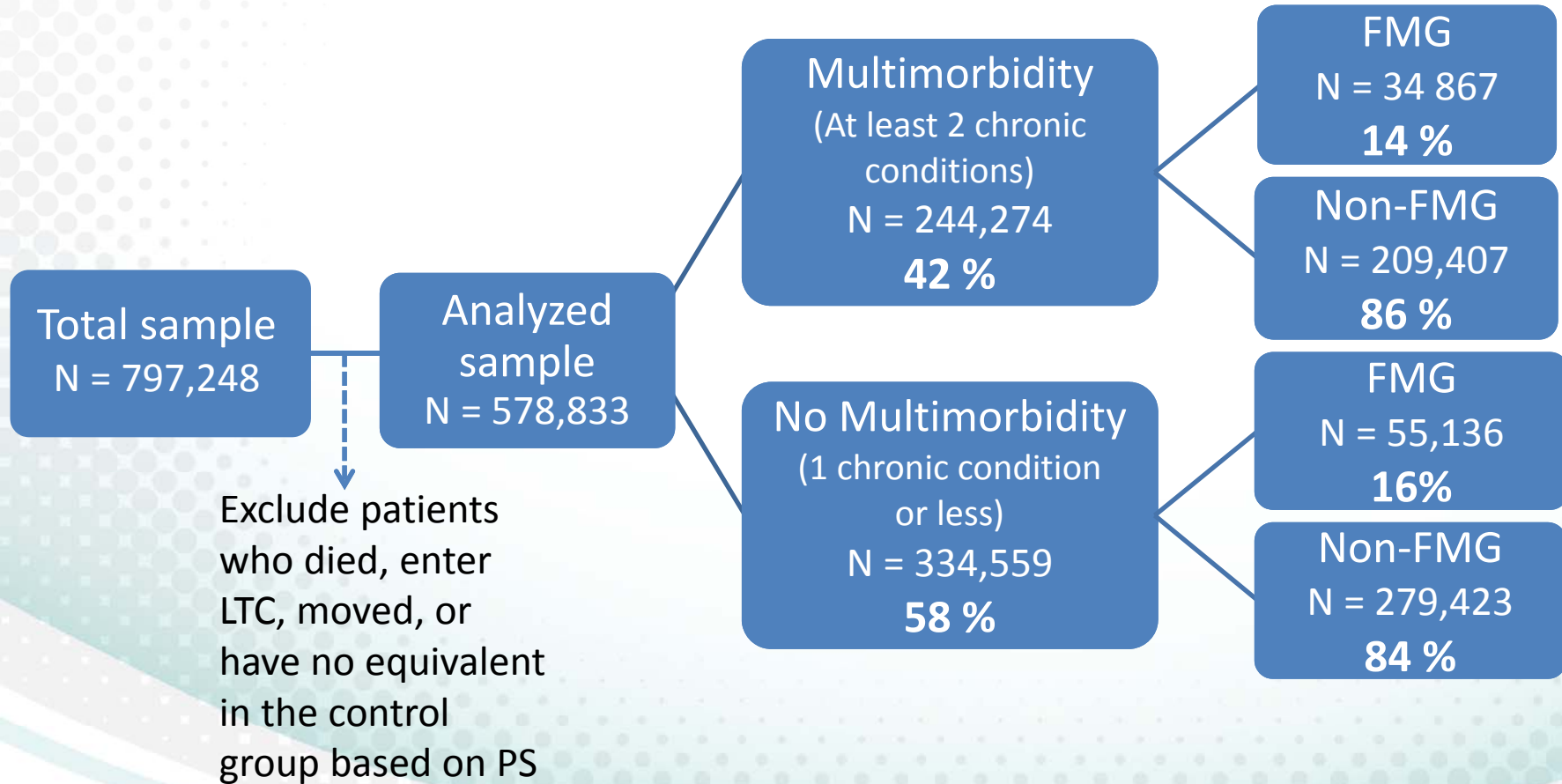
Cohort Administrative Database

- Administrative data on about 800,000 vulnerable patients from 2000-2010

  - Vulnerable for RAMQ billing purposes: elderly or chronically ill

  - ~110 000 FMG patients and ~700 000 non-FMG

  - 7-year panel for each individual

    - 2 years before / 5 years after time-zero: vulnerable registration and FMG registration when applicable (2002-2005)

- Geographic, demographic and socioeconomic characteristics; morbidity and mortality information

Methods

- Estimate the intent-to-treat (ITT) effect, given the voluntary policy environment

- Individuals who die, enter a long-term care facility, move to a different region (4 types), or live in very remote regions of QC are not included in the analysis

- Propensity score weighting
  - Predicted probability of FMG participation based on patient's pre-period characteristics

- Difference-in-differences regressions
  - Compare utilization changes for FMG patients relative to controls
  - Controls for shared time trends and fixed differences between FMG and non-FMG

Sample Size and Characteristics at Baseline - Before Registration as Vulnerable

Total sample
N = 797,248

Analyzed sample
N = 578,833

Exclude patients who died, enter LTC, moved, or have no equivalent in the control group based on PS

Multimorbidity
(At least 2 chronic conditions)
N = 244,274
42 %

No Multimorbidity
(1 chronic condition or less)
N = 334,559
58 %

FMG
N = 34 867
14 %

Non-FMG
N = 209,407
86 %

FMG
N = 55,136
16%

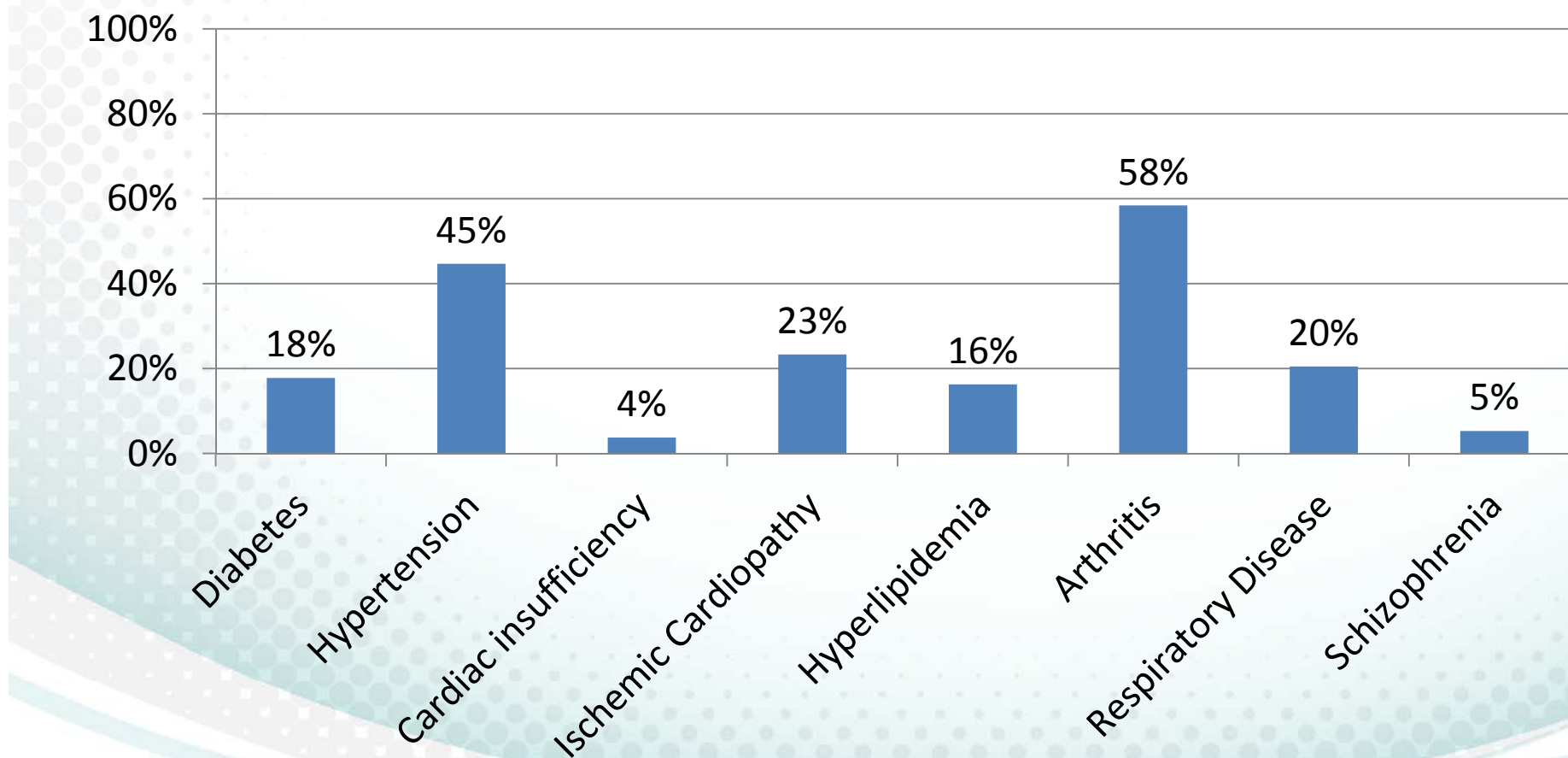Non-FMG
N = 279,423
84 %

Prevalence of Chronic Disease
by Multimorbidity Status
(year before vulnerable registration)
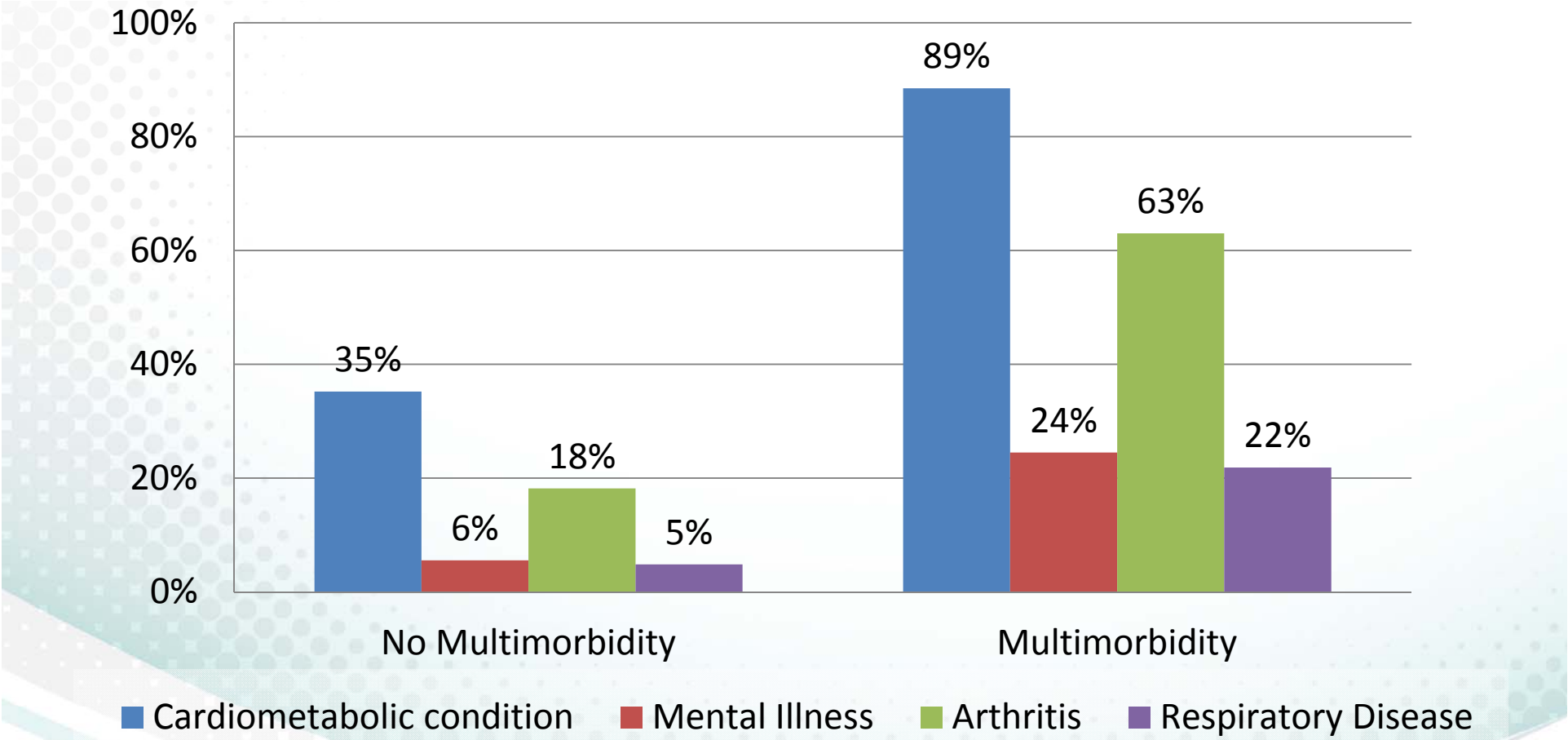
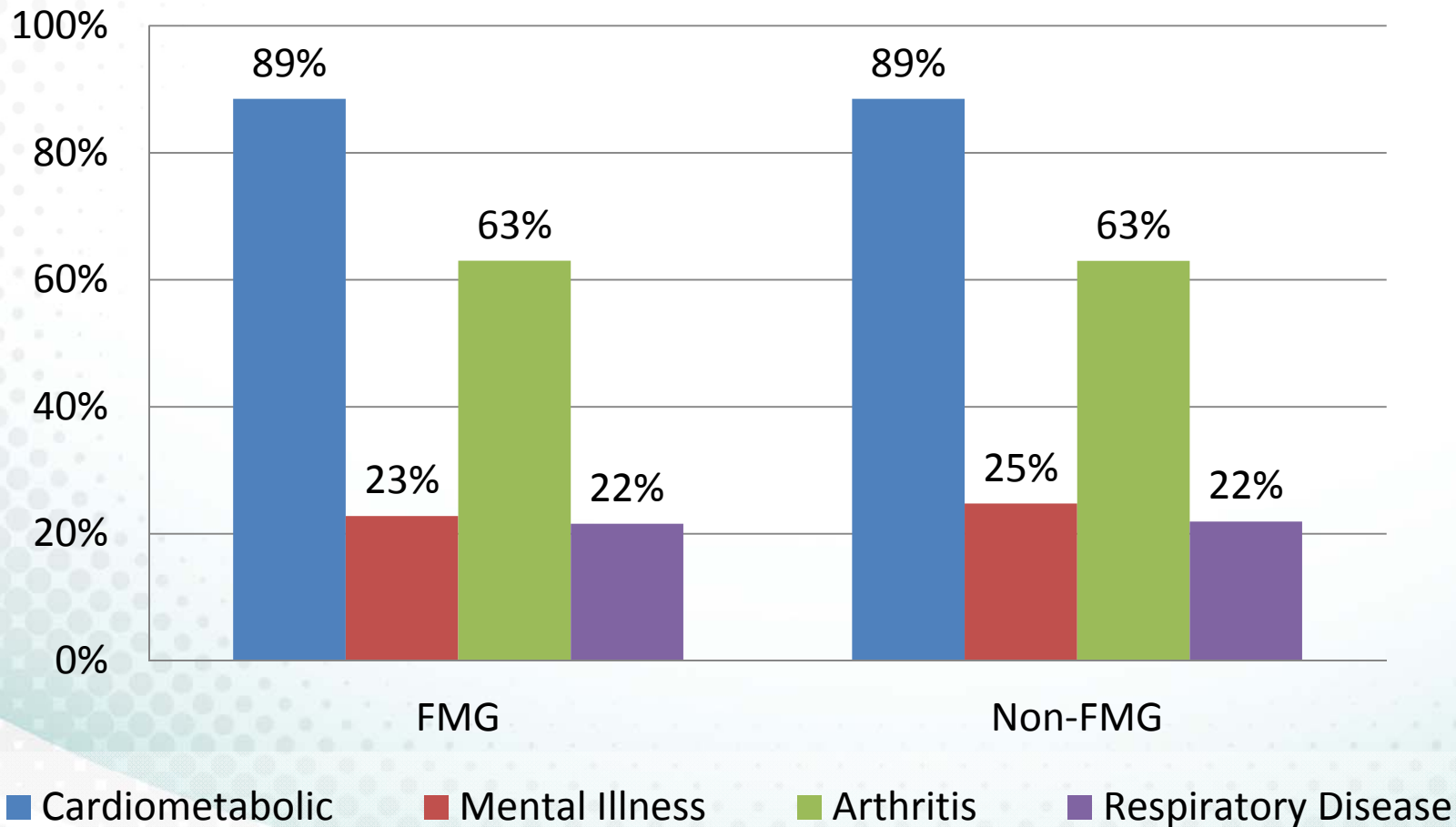# Concurrent chronic disease among patients with anxiety or depressive disorder
(year before vulnerable registration)

Disease	Percentage
Diabetes	18%
Hypertension	45%
Cardiac insufficiency	4%
Ischemic Cardiopathy	23%
Hyperlipidemia	16%
Arthritis	58%
Respiratory Disease	20%
Schizophrenia	5%

Prevalence of Chronic Conditions Among Patients with Multimorbidity

(year before vulnerable registration)

Legend: Cardiometabolic, Mental Illness, Arthritis, Respiratory Disease

FMG: Cardiometabolic 89%, Mental Illness 23%, Arthritis 63%, Respiratory Disease 22%

Non-FMG: Cardiometabolic 89%, Mental Illness 25%, Arthritis 63%, Respiratory Disease 22%

Health Services Utilization

DD estimate of FMG effect

Number of Visits	No Multimorbidity Marginal Effect *(Standard Error)*	Multimorbidity Marginal Effect *(Standard Error)*	Mean in Pre-period Mean *(Standard Deviation)*
GP	-0.1625*** *(0.0014)*	-0.0752*** *(0.0013)*	5.0 *(4.6)*
Specialists	-0.0484*** *(0.0021)*	-0.0227*** *(0.0020)*	4.1 *(5.8)*
ER	-0.0207*** *(0.0044)*	0.0437*** *(0.0036)*	0.6 *(1.3)*
Hospitalizations	-0.0416*** *(0.0090)*	0.1333*** *(0.0056)*	0.1 *(0.5)*

Regression models include control for gender, age, defavorisation index and calendar year and results are weighted by the inverse probability of being registered in a FMG. *Significant at $p < 0.05$, **significant at $p < 0.005$, ***significant at $p < 0.001$

Health Services Costs

DD estimate of FMG effect

Costs	No Multimorbidity Marginal Effect *(Standard Error)*	Multimorbidity Marginal Effect *(Standard Error)*	Mean in Pre-period Mean *(Standard Deviation)*
GP	-10.31 (8.93)	3.11 (11.79)	152 (146)
Specialists	0.06 (5.60)	4.05 (4.82)	210 (302)
ER	0.53 (0.50)	5.47*** (1.64)	32 (96)
Hospitalizations	-22.61 (13.95)	357.53*** (100.67)	927 (3924)
Total	-24.62 (18.06)	342.58** (109.71)	1372 (4085)

Regression models include control for gender, age, defavorisation index and calendar year and results are weighted by the inverse probability of being registered in a FMG. *Significant at p<0.05, **significant at p <0.005, ***significant at p<0.001

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Québec

Conclusions

- Chronic diseases rates, among patient with multimorbidity, are similar in FMGs and non-FMGs
    - 89% with a cardiometabolic condition
    - 63% have arthritis
- Among patient with anxiety and depressive disorders, arthritis (58%) and hypertension (45%) are common concurrent conditions
- FMGs generate small reductions in utilization among less complex patients
    - Reductions in GP visits also; no impact on costs
- Results suggest that FMGs increase ED and hospital use and costs for patients with multimorbidity
- Our conclusions are limited by chronic conditions identifiable in administrative databases

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