# Prevalence of Chronic Migraine, Headache-Related Disability and Sociodemographic Factors in the US Population: Results from the American Migraine Prevalence and Prevention (AMPP) Study

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## BACKGROUND

- Chronic migraine (CM) is broadly defined by the presence of migraine with headaches on ≥15 days per month.
- A systematic review of population-based studies utilizing various criteria reported the majority of CM prevalence estimates ranged from 1.4% to 2.2% (Natoli et al. *Cephalalgia* 2010;30:599-609).

## OBJECTIVES

1. To estimate the prevalence of CM in the US population.
2. To characterize persons with CM by sociodemographics and headache-related disability.

## METHODS

- In 2004, we mailed surveys to a sample of 120,000 US households stratified to represent US Census data.
- Headache frequency, symptoms, sociodemographics and headache-related disability (MIDAS) data were obtained. Surveys were returned by 162,756 individuals aged ≥12. 28,621 reported severe headache.
- CM was defined as ICHD-2 migraine with ≥15 headache days/month; EM was defined as ICHD-2 migraine with <15 headache days/month.
- Crude and sociodemographically adjusted prevalence ratios (PRs) were generated. Male-female contrasts and EM-CM contrasts on MIDAS grade were done using ordinal logistic regression adjusting for sociodemographics (age, gender, race, household income and size, census region, population density).

## CONCLUSIONS

- In this US population sample, prevalence of CM was approximately 1% which is lower than previous estimates, perhaps because our case definition required self-reported "severe headache" for inclusion.
- CM prevalence was highest among females, in mid-life, and in lower income households.
- CM represented an increasing proportion of all migraine with increasing age, suggesting that the prevalence of EM declines more quickly with age than CM.
- Among persons with CM, females reported significantly greater headache-related disability than males.
- As reported in prior research, persons with CM reported significantly more headache-related disability than persons with EM.

## RESULTS

- In this US population sample, the overall prevalence of CM was 0.91% (males = 0.48%, females = 1.29%).
- CM represented 7.7% of overall migraine cases.
- In crude and adjusted models, CM prevalence was higher in females, during mid-life, and in households with the lowest income (Table 1).
- CM prevalence increased throughout adolescence and mid-life, peaked between age 40-59, and declined after age 50 (Figure 1).
- As a proportion of all migraine, the contribution of CM increased with age (Figure 2).
- Headache-related disability (MIDAS score) among those with CM was significantly greater in females than males (Figure 3).
- Headache-related disability (MIDAS score) was significantly greater among persons with CM compared to EM (Figure 4).

### Table 1: Crude Prevalence and Adjusted Prevalence Ratios for CM

| | | Crude Prevalence Rates | | Adjusted* Prevalence Ratios | |
|---|---|---|---|---|---|
| | | Males N=374 | Females N=1,101 | Males | Females |
| Age (years) | 12 thru 17 | 0.3% | 0.5% | ref | ref |
| | 18 thru 29 | 0.4% | 1.9% | 1.44 (0.83-2.49) | 4.02 (2.76-5.86) |
| | 30 thru 39 | 0.7% | 1.8% | 2.83 (1.68-4.77) | 4.28 (2.93-6.24) |
| | 40 thru 49 | 0.8% | 1.9% | 3.31 (1.99-5.49) | 4.71 (3.24-6.83) |
| | 50 thru 59 | 0.6% | 1.3% | 2.28 (1.34-3.87) | 3.47 (2.36-5.09) |
| | ≥ 60 | 0.2% | 0.5% | 0.78 (0.44-1.37) | 1.08 (0.72-1.62) |
| Race | Caucasian | 0.5% | 1.2% | ref | ref |
| | African-American | 0.7% | 1.7% | 1.3 (0.9-1.86) | 1.01 (0.83-1.22) |
| | Other | 0.6% | 2.5% | 1.28 (0.87-1.86) | 1.14 (0.92-1.42) |
| Region | New England | 0.5% | 0.8% | ref | ref |
| | Middle Atlantic | 0.4% | 1.2% | 0.76 (0.44-1.32) | 1.34 (0.93-1.94) |
| | East North Central | 0.4% | 1.1% | 0.83 (0.49-1.41) | 1.26 (0.88-1.82) |
| | West North Central | 0.4% | 0.9% | 0.68 (0.36-1.27) | 1.07 (0.7-1.63) |
| | South Atlantic | 0.5% | 1.4% | 0.95 (0.57-1.6) | 1.58 (1.11-2.25) |
| | East South Central | 0.8% | 1.9% | 1.03 (0.58-1.83) | 1.71 (1.16-2.53) |
| | West South Central | 0.7% | 1.7% | 1.03 (0.6-1.76) | 1.69 (1.17-2.43) |
| | Mountain | 0.5% | 1.6% | 0.89 (0.49-1.63) | 1.77 (1.2-2.61) |
| | Pacific | 0.4% | 1.2% | 0.79 (0.45-1.38) | 1.36 (0.94-1.97) |
| Market Size (CBSA†) | <100,000 | 0.8% | 1.7% | ref | ref |
| | 100,000-499,999 | 0.6% | 1.5% | 0.85 (0.63-1.16) | 0.98 (0.81-1.19) |
| | 500,000-1,999,999 | 0.5% | 1.4% | 0.77 (0.57-1.04) | 0.97 (0.81-1.17) |
| | ≥2,000,000 | 0.3% | 1.0% | 0.6 (0.44-0.82) | 0.95 (0.79-1.14) |
| Income | < $22,500 | 1.3% | 2.6% | ref | ref |
| | $22,500 - 39,999 | 0.5% | 1.4% | 0.42 (0.32-0.56) | 0.47 (0.4-0.55) |
| | $40,000-59,999 | 0.3% | 1.0% | 0.24 (0.17-0.33) | 0.34 (0.28-0.4) |
| | $60,000-89,999 | 0.3% | 0.7% | 0.24 (0.17-0.33) | 0.23 (0.19-0.28) |
| | ≥$90,000 | 0.2% | 0.5% | 0.18 (0.13-0.26) | 0.16 (0.12-0.2) |
| Household Size | 1 member | 0.6% | 1.1% | ref | ref |
| | 2 members | 0.5% | 1.1% | 1.39 (1.01-1.92) | 1.2 (0.98-1.46) |
| | 3 members | 0.5% | 1.4% | 1 (0.69-1.44) | 1.23 (0.99-1.53) |
| | 4 members | 0.4% | 1.2% | 0.79 (0.53-1.18) | 1.15 (0.92-1.46) |
| | ≥5 members | 0.5% | 1.7% | 1.1 (0.74-1.62) | 1.55 (1.23-1.94) |

*Adjusted for all covariates in table, adjusted prevalence ratios and 95% confidence limits estimated using log-binomial models predicting migraine status (within gender)

†CBSA = Core Based Statistical Area (measure of population density)
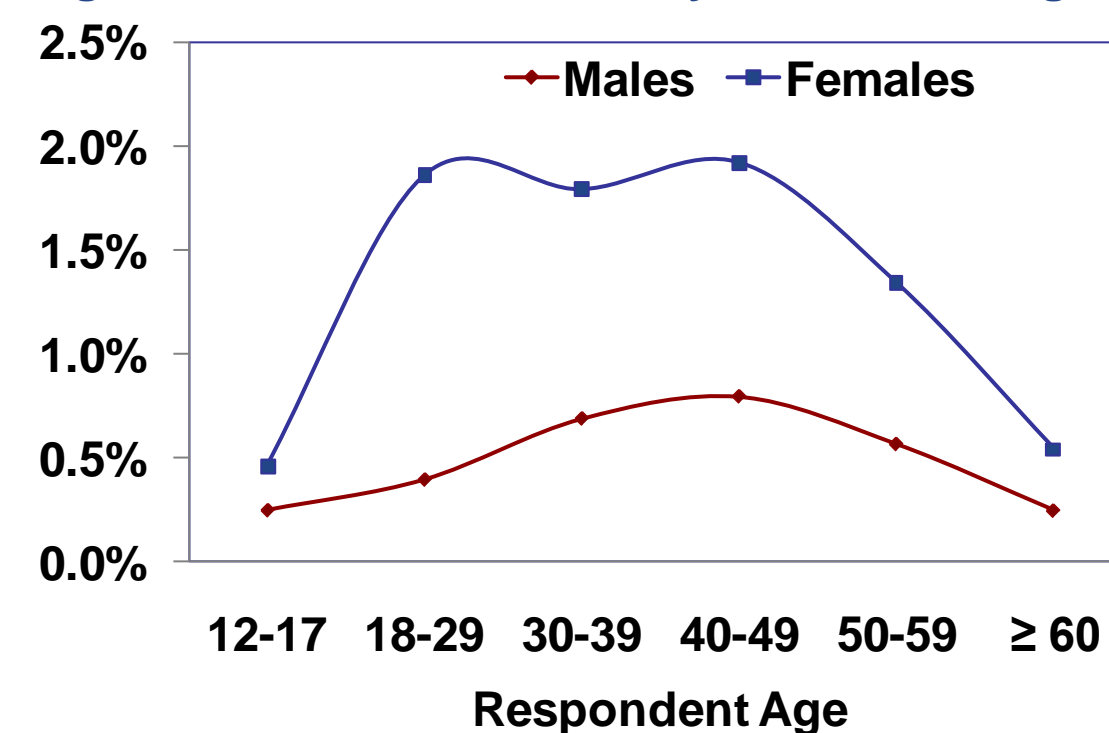
### Figure 1: Prevalence of CM by Gender and Age



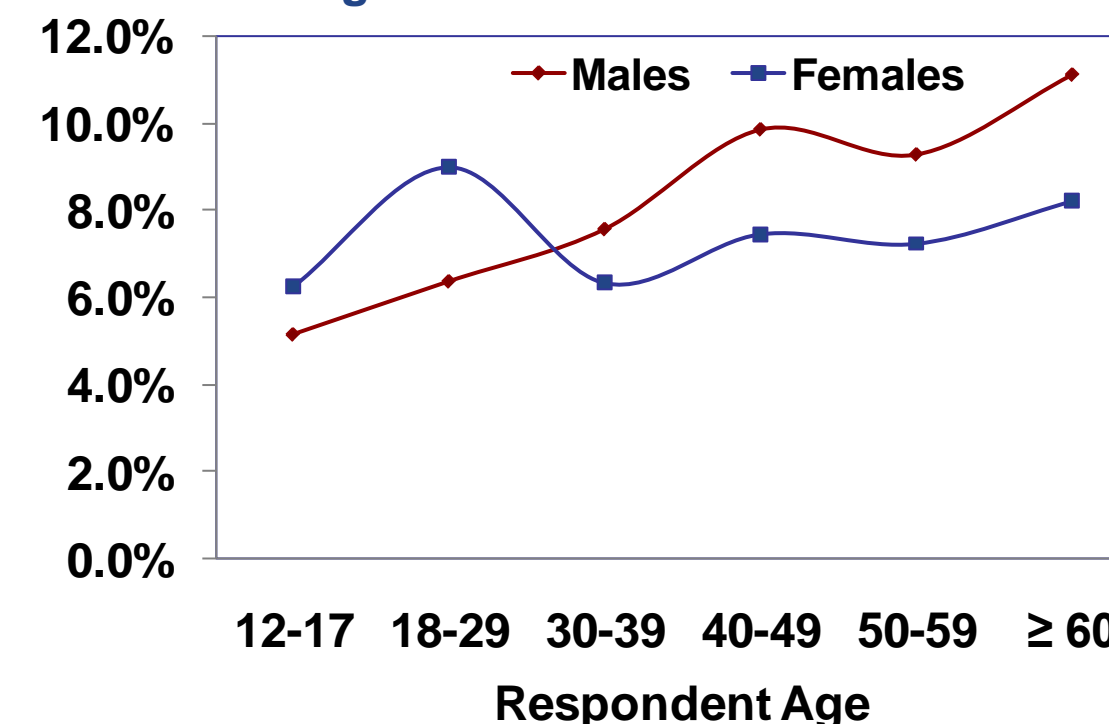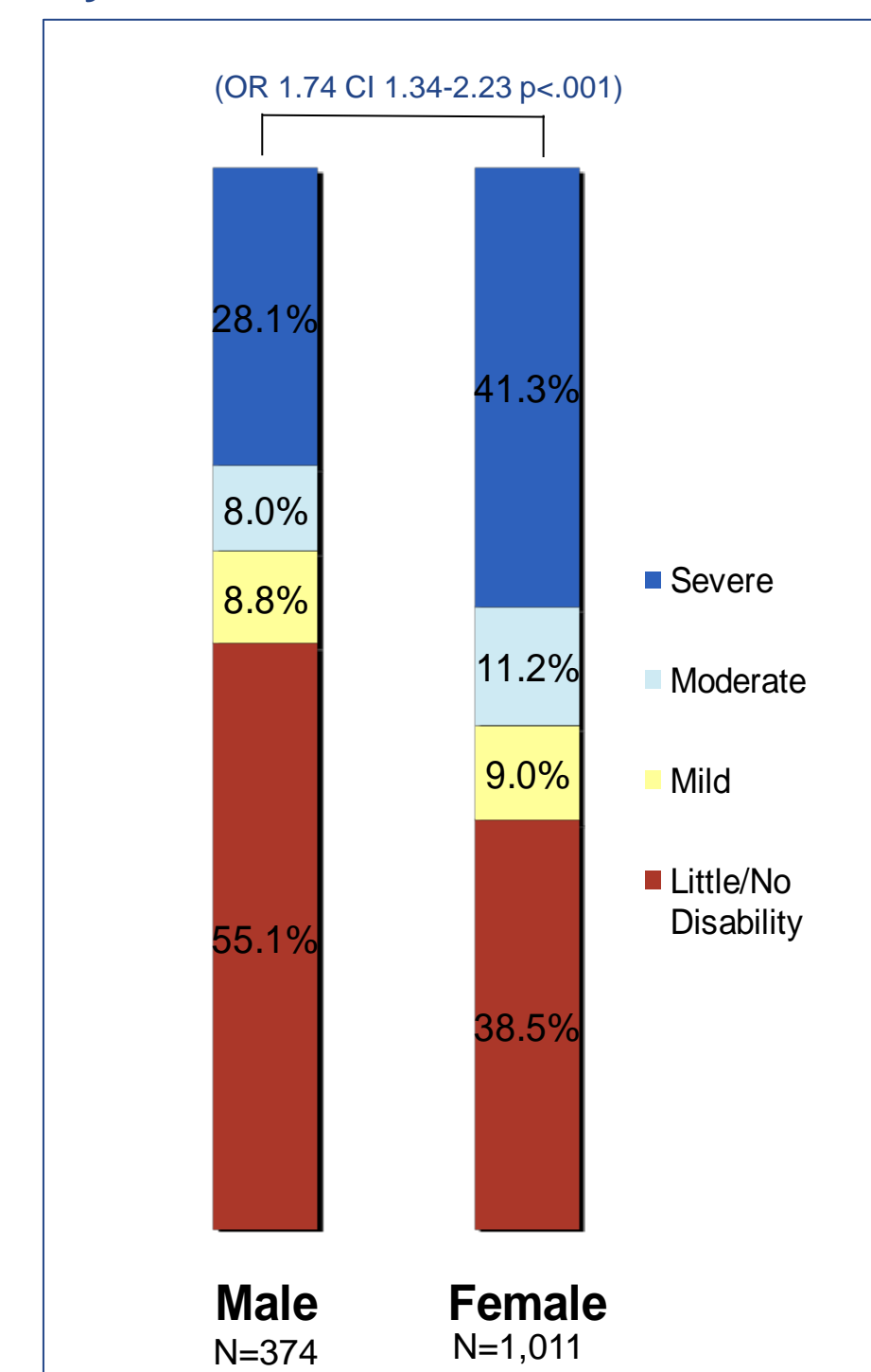### Figure 2: CM as the Proportion of all Migraine by Gender and Age



### Figure 3: MIDAS Grade Distribution by Gender in CM



(OR 1.74 CI 1.34-2.23 p<.001)

Male N=374 — Severe 28.1%, Moderate 8.0%, Mild 8.8%, Little/No Disability 55.1%
Female N=1,011 — Severe 41.3%, Moderate 11.2%, Mild 9.0%, Little/No Disability 38.5%

### Figure 4: MIDAS Grade Distribution for EM vs. CM



(OR 3.59 CI 3.96-3.25 p<.001)

EM N=17,714 — Severe 9.5%, Moderate 10.7%, Mild 14.7%, Little/No Disability 65.1%
CM N=1,475 — Severe 38.0%, Moderate 10.4%, Mild 8.9%, Little/No Disability 42.7%

Ordinal logistic regression controlling for demographics (age, gender, race, household income and size, census region, population density).