

# CLOSING THE GAP OR WIDENING THE DIVIDE? RACIAL AND SEX DISPARITIES IN MULTIPLE MYELOMA MORTALITY IN THE UNITED STATES, 1999-2020

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## INTRODUCTION

Proteasome inhibitors, immunomodulatory agents, and anti-CD38 monoclonal antibodies have transformed multiple myeloma (MM) outcomes over two decades, yet therapeutic advances benefit populations unevenly. Whether novel agent introduction narrowed or merely paralleled existing racial and sex-based mortality disparities remains unresolved.

## AIM

To characterize MM mortality trends and evaluate whether therapeutic milestones translated into measurable disparity reduction across racial and sex subgroups in the United States from 1999 to 2020.

## METHOD

Using the CDC WONDER Underlying Cause of Death database, we analyzed 242,026 MM deaths (ICD-10 code, C90.0). Age-adjusted mortality rates (AAMRs) per 100,000 were standardized to the 2000 U.S. population. Joinpoint regression quantified annual percent change (APC) by era; mortality rate ratios (RRs) assessed racial disparity magnitudes over time.

## CONCLUSIONS

Novel therapies accelerated MM mortality decline across racial groups but failed to close the racial gap. The 2009–2014 plateau in mortality among Black individuals preceding the daratumumab era suggests that access barriers, not biology, may drive persistent disparities. Proportional improvement without relative gap reduction represents an equity illusion. Targeted interventions ensuring equitable access to novel agents are urgently needed.

## RESULTS

National AAMRs declined from 3.9 (1999) to 3.1 (2020). Joinpoint analysis revealed a critical pattern: mortality among Black patients declined from 1999 to 2009 (APC, −2.14%), plateaued from 2009 to 2014, then resumed its decline post-2014 (APC, −1.40%), temporally coinciding with next-generation agent approvals. Mortality among White patients mirrored this acceleration (APC, −2.11%, 2014–2020). Despite proportionally similar absolute AAMR reductions (Black: 7.4 to 5.5 [25.7%] vs White: 3.5 to 2.7 [22.8%]), the Black-to-White RR remained statistically unchanged (2.11 to 2.04; P=0.26). The greatest burden fell on Black male patients (AAMR, 8.7 to 6.7) and the lowest fell on White female patients (2.9 to 2.1), preserving a more than 3-fold cross-group disparity throughout.

| YEAR | YEAR CODE | DEATHS | POPULATION | CRUDE RATE | AGE ADJUSTED RATE |
|------|-----------|--------|------------|------------|-------------------|
| 1999 | 1999      | 10239  | 264860911  | 3.9        | 3.9               |
| 2000 | 2000      | 10396  | 266680071  | 3.9        | 3.9               |
| 2001 | 2001      | 10451  | 269442441  | 3.9        | 3.8               |
| 2002 | 2002      | 10626  | 271468959  | 3.9        | 3.8               |
| 2003 | 2003      | 10511  | 273334813  | 3.8        | 3.7               |
| 2004 | 2004      | 10305  | 275408832  | 3.7        | 3.6               |
| 2005 | 2005      | 10426  | 277467826  | 3.8        | 3.6               |
| 2006 | 2006      | 10380  | 279662378  | 3.7        | 3.5               |
| 2007 | 2007      | 10524  | 281841936  | 3.7        | 3.5               |
| 2008 | 2008      | 10295  | 284015338  | 3.6        | 3.4               |
| 2009 | 2009      | 10362  | 286021283  | 3.6        | 3.3               |
| 2010 | 2010      | 10646  | 287488674  | 3.7        | 3.4               |
| 2011 | 2011      | 11042  | 289773146  | 3.8        | 3.4               |
| 2012 | 2012      | 11446  | 291427645  | 3.9        | 3.5               |
| 2013 | 2013      | 11430  | 293040769  | 3.9        | 3.4               |
| 2014 | 2014      | 11689  | 294939861  | 4          | 3.4               |
| 2015 | 2015      | 11767  | 296738250  | 4          | 3.3               |
| 2016 | 2016      | 11828  | 298009834  | 4          | 3.3               |
| 2017 | 2017      | 9557   | 253935650  | 3.8        | 2.9               |
| 2018 | 2018      | 11822  | 300827082  | 3.9        | 3.1               |
| 2019 | 2019      | 12013  | 301639596  | 4          | 3.1               |
| 2020 | 2020      | 11971  | 302170901  | 4          | 3.1               |
|      |           | 242026 | 6286080004 | 3.9        | 3.4               |

## ACKNOWLEDGEMENTS

The authors acknowledge the Centers for Disease Control and Prevention (CDC) WONDER database for providing publicly accessible mortality data used in this analysis.

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