

KEY POINTS

Patients with rheumatoid arthritis (RA) are more likely to experience productivity loss (PL) compared to patients without RA, however, there is no significant difference in the expected cost of PL between the two groups

BACKGROUND

- Rheumatoid Arthritis is the third most common type of arthritis in the United States¹
- There is a considerable economic impact of productivity loss associated with Rheumatoid Arthritis^{2,3}

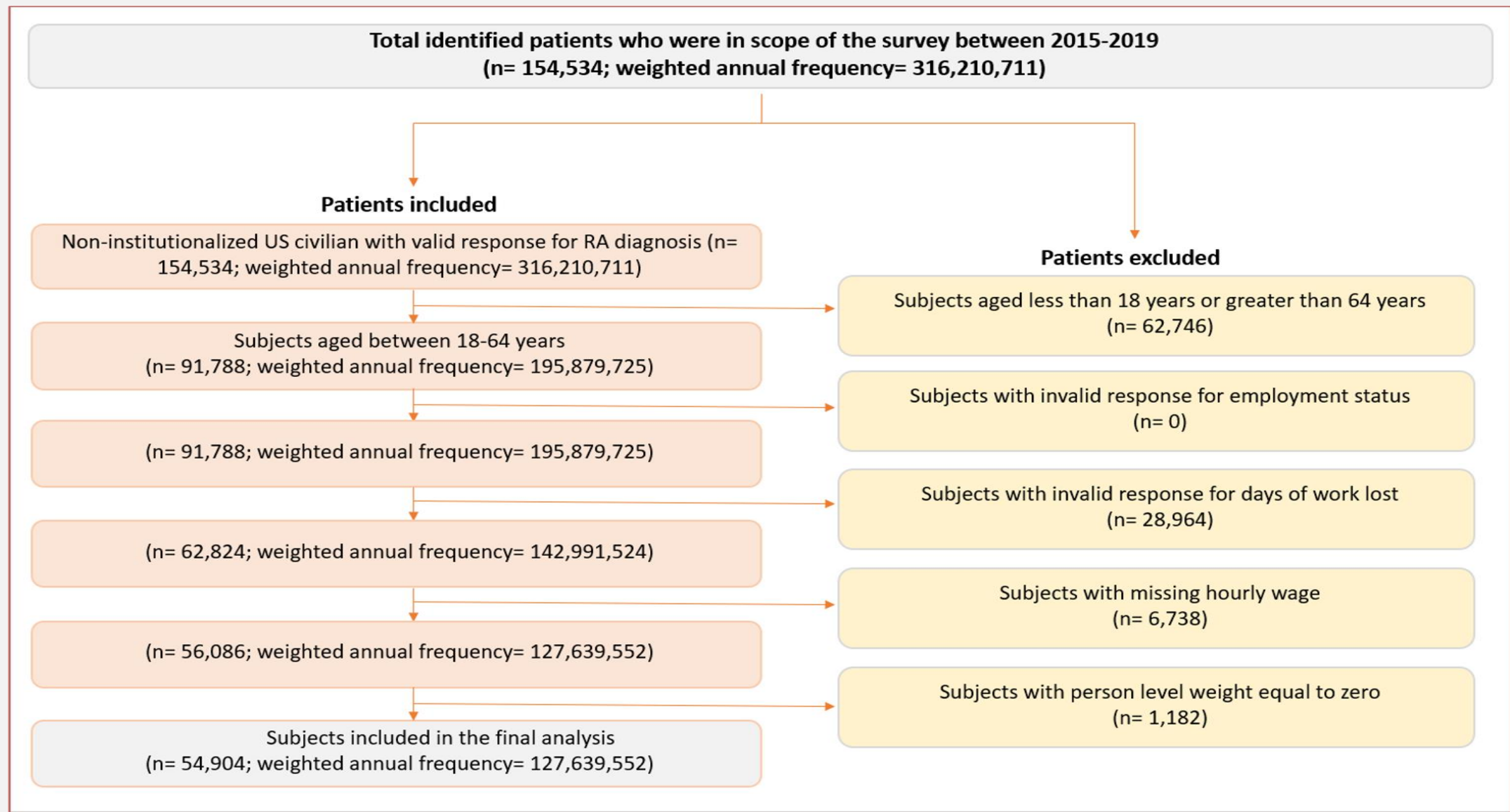
OBJECTIVES

This analysis focuses on evaluating the economic impact of productivity loss associated with Rheumatoid Arthritis in the United States

METHODS

- Study Design and Data Source:** Cross-sectional study using 2015-2019 Medical Expenditure Panel Survey (MEPS) Household Component
- Study Population:** Non-institutionalized working-age adults (18-64 years) with or without RA who had valid responses for employment status, hourly wage, and days of work lost
- Outcome Measures:** PL among those with RA to those without RA, computed by multiplying hourly wage, number of hours worked per day and number of missed workdays
- Statistical Analysis:** Inverse probability treatment weights (IPTW) were used to account for differences in demographic and clinical characteristics between RA and non-RA subjects. IPTW weighted two-part generalized linear model (GLM) with logistic regression and gamma distribution with log link was employed to estimate the cost of PL associated with RA

Figure 1: Sample Selection



RESULTS

- The study sample consisted of 54,904 subjects with or without RA between 18-64 years of age, representing 127 million patients annually

IPTW-adjusted Characteristics

- After employing IPTW weighting, there was no evidence of imbalance between RA and non-RA groups
- Majority of RA group were females while the non-RA group consisted of similar proportion of male and female subjects
- The proportion of smokers in RA group was slightly higher than that in the non-RA group

IPTW adjusted cost of PL among working-age subjects with or without RA

- Mean cost of PL among subjects with RA is significantly higher than that among subjects without RA in IPTW weighted sample (Table 2)

IPTW weighted Generalized linear model

- Patients with RA were 47% more likely to have PL compared to subjects without RA (Table 3)
- Among subjects who had PL, the expected cost of PL is not statistically different across people with RA and those without RA (Table 3)

Table 2: IPTW adjusted cost of Productivity Loss

Productivity loss, \$	Patients with RA	Patients without RA	p-value
	IPT weighted n = 2,686,089	IPT weighted n = 2,694,000	
Mean (SE)	1,183.77 (113.28)	901.07 (24.67)	0.015

LIMITATIONS

- Treating wage as a measure of the opportunity cost of productivity loss, even if it holds a long tradition in economics, may not be accurate
- MEPS is a survey data, as a result, this study may have some inherent biases such as under-reporting, missing data, and recall bias

CONCLUSIONS

- Working-age adults with Rheumatoid Arthritis experience substantial productivity loss
- RA patients are associated with a higher likelihood of PL compared to the patients without RA
- Treatment strategies need to improve patient functioning to reduce PL associated with the disease

REFERENCES

- [1] Xu, Y. and Wu, Q., 2021. Prevalence Trend and Disparities in Rheumatoid Arthritis among US Adults, 2005–2018. Journal of clinical medicine, 10(15), p.3289.
- [2] Hsieh, P.H., Wu, O., Geue, C., McIntosh,E., McInnes, I.B. and Siebert, S., 2020. Economic burden of rheumatoid arthritis: a systematic review of literature in biologic era. Annals of the rheumatic diseases, 79(6), pp.771-777.
- [3] Gunnarsson, C., Chen, J., Rizzo, J.A., Ladapo, J.A., Naim, A. and Lofland, J.H., 2015. The employee absenteeism costs of rheumatoid arthritis: evidence from US national survey data. Journal of occupational and environmental medicine, 57(6), pp.635-642.

Table 1: IPTW-adjusted characteristics for patients with RA and patients without RA

Characteristics	Patients with RA Weighted n = 2,686,089	Patients without RA Weighted n = 2,694,000	Standardized difference in percent
Age, mean (SE)	49.3 (0.5)	49.5 (0.1)	
Gender, n (%)			
Male	1,090,178 (40.59)	1,085,039 (40.28)	0.07
Female	1,595,911 (59.41)	1,608,961 (59.72)	
Race/ethnicity, n (%)			
Hispanic	298,441 (11.11)	331,568 (12.31)	0.34
NH White	1,784,531 (66.44)	1,738,480 (65.00)	0.16
NH Black	417,540 (15.54)	431,262 (16.00)	0.09
NH Asian	93,207 (3.47)	101,610 (4.00)	0.05
NH Other	92,370 (3.44)	91,081 (3.00)	0.00
Geographic region, n (%)			
Northeast	449,311 (16.73)	378,748 (14.06)	0.24
Midwest	628,111 (23.38)	662,868 (24.61)	0.02
South	1,137,363 (42.34)	1,140,989 (42.35)	0.13
West	471,305 (17.55)	511,395 (18.98)	0.02
Insurance status, n (%)			
Privately insured	2,192,410 (81.62)	2,227,492 (82.68)	0.21
Publicly insured	321,032 (11.95)	302,731 (11.24)	0.12
Uninsured	172,647 (6.43)	163,777 (6.08)	0.12
Smoking Indicator, n (%)			
Yes	616,194 (22.94)	593,175 (22.02)	0.03
No	2,069,895 (77.06)	2,100,825 (77.98)	
Highly educated, n (%)			
Yes	1,010,362 (37.61)	1,041,977 (38.68)	0.06
Others	1,675,727 (62.39)	1,652,023 (61.32)	
NOCHRCOM, mean (SE)	1.4 (0.06)	1.4 (0.02)	0.78
Year, n (%)			
2015	550,545 (20.50)	567,587 (21.07)	0.05
2016	574,376 (21.38)	576,806 (21.41)	0.00
2017	531,064 (19.77)	543,682 (20.18)	0.15
2018	514,900 (19.17)	507,217 (18.83)	0.01
2019	515,203 (19.18)	498,708 (18.51)	0.11

n: Sample size; NH: Non-Hispanic; NOCHRCOM: Number of chronic comorbidities; SE: Standard Error

Table 3: IPTW weighted two-part Generalized linear model results

Association between RA and occurrence of PL (Result from the logistic regression model of the two-part modeling)		
Variable	OR	95 CI
Rheumatoid Arthritis	1.47	1.22-1.77
Association between RA and actual cost of PL (Result from the Gamma regression model with log link in the two-part modeling)		
Variable	Ratio of expected cost	95 CI of ratio of expected cost
Rheumatoid Arthritis	1.12	0.93-1.34

CI: Confidence Interval; OR: Odds Ratio; PL: Productivity Loss

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