Characteristics differ based on usual cigar-type use among U.S. adults: Analysis from the tobacco use supplement to the current population survey

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ABSTRACT

The tobacco products landscape is continually shifting, and there are concerns about the increased popularity of non-cigarette tobacco products, including cigars. This study examines characteristics associated with usual cigar-type use. Data are from the 2018–19 Tobacco Use Supplement to the Current Population Survey. Multinomial logistic regression was used to assess the association between sociodemographic characteristics and cigar-type use (i.e., large cigars, cigarillos, and little filtered cigars). Analyses also examined factors relative to large cigar use and further stratified by sex. Of 137,221 adults included in the study, 1467 used large cigars most often, 513 used cigarillos most often, 446 used little filtered cigars most often, and the remaining 134,795 did not use cigars. In adjusted models, males had greater odds for using all types of cigars relative to non-use. In contrast, males were less likely to use cigarillos (AOR 0.28, 95% CI 0.20–0.41) and filtered cigars (AOR 0.20, 95% CI 0.14–0.28) relative to large cigars. Black adults had greater odds of using all types of cigars relative to non-use, and cigarillos (AOR 3.55, 95% CI 2.47–5.08) and filtered cigars (AOR 2.50, 95% CI 1.70–3.68) relative to large cigars. Education, income, and other tobacco use also varied according to cigar type. Characteristics of those who usually use large cigars differed significantly from those who usually use cigarillos, little filtered cigars, or reported no cigar use.

1. Introduction

Significant progress has been made in reducing cigarette smoking over the past few decades (U.S. Department of Health and Human Services, 2014); however, there are concerns about the increased popularity of other tobacco products, including cigars. For example, cigar consumption has risen by 85%, from 6.2 billion cigars smoked in 2000 to over 11 billion in 2015. Cigarette consumption decreased by nearly 40%, from 435 billion to 267 billion during the same period (Wang, 2016). Cigar smoking has become a public health burden in the U.S. Recent estimates indicate 3.6%, or 8.7 million, U.S. adults smoked cigars some days or every day in 2019 (Cornelius et al., 2020). Cigars are not a safe alternative to cigarettes. It is well documented that cigar smoke contains many of the same toxic and carcinogenic compounds as traditional cigarette smoke (National Cancer Institute, 1998). Cigar use is associated with an increased risk of lung, oral, esophageal, and laryngeal cancers and coronary heart disease (Cornelius et al., 2020). A previous study estimated that in 2010 alone, regular cigar smoking was responsible for approximately 9000 premature deaths and economic costs of 23 billion dollars (Nonnemaker et al., 2014).

In the U.S., the three commonly sold cigar types are large cigars, cigarillos, and little filtered cigars (National Cancer Institute, 1998). The cigar types differ in size and production process: large cigars typically contain at least one-half ounce of aged, fermented tobacco (i.e., as much as a pack of cigarettes) and usually take 1–2 h to smoke; cigarillos tend to be between 3 and 4 in., contain about 3 g of tobacco, and typically exclude a filter; and little filtered cigars are about the same size and shape as cigarettes and are often used interchangeably (National Cancer Institute, 1998; Maxwell, 2015). Some common brands for large cigars and cigarillos are Black and Milds, Swisher Sweets, Phillies, and Prime time; Winchester and Cheyenne are common brands for little filtered cigars. Some studies have identified varying characteristics associated with cigar use, including sociodemographic factors and co-use with other substances (Corey et al., 2018; Borawski et al., 2010; Chen-Sankey et al., 2021; Richardson et al., 2013; Cohn et al., 2015). A study using Wave 3 of the Population Assessment of Tobacco and Health Study...
found that non-Hispanic Black adults were more likely to smoke cigars in the past 30 days, with results consistent across cigar types (Chen-Sankey et al., 2021). Other national studies have identified some key demographic differences based on the usual cigar type. Adults who use large cigars are more likely to be non-Hispanic White, male, older, and report higher income and educational attainment (Corey et al., 2018; Borawski et al., 2010; Richardson et al., 2013; Corey et al., 2014). In contrast, adults who report using cigarillos or filtered cigars are more likely to be younger, non-Hispanic Black, and have lower income and educational attainment (Corey et al., 2018; Borawski et al., 2010; Richardson et al., 2013; Corey et al., 2014). Previous studies report high use of cigarettes among this population (Corey et al., 2014), and that cigarette use is less common among those who use large cigars compared to those using cigarillos or filtered cigars (Corey et al., 2018; Richardson et al., 2013). While the tobacco products landscape has witnessed significant changes in the last few years with the emergence of new products, research on usual cigar-type use has been limited. The current study examined characteristics associated with usual cigar-type use (large cigars, cigarillos, and little filtered cigars) using a nationally representative U.S. sample of adults from the 2018–19 Tobacco Use Supplement to the Current Population Survey (TUS-CPS) study.

2. Methods

2.1. Data

The Tobacco Use Supplement to the Current Population Survey (TUS-CPS) is a large household survey among the civilian noninstitutionalized population 16 years of age and older in the United States. It is administered by the Census Bureau and sponsored by the National Cancer Institute (NCI). The CPS is a monthly labor force survey conducted in more than 50,000 interviewed households across the country. Since 1992, the TUS-CPS has been conducted every three to four years as a supplement of the CPS to assess many topics, including smoking status, amount smoked, smoking history, quit attempts, intention to quit, level of nicotine dependence, and other tobacco-related topics. We excluded 234 respondents with “No response,” “Refused,” or “Don’t Know” to the survey question deriving the main outcome variable. The final analytic sample included 137,221 self-respondents who were 18 years and older and completed the labor force interview from 2018 to 2019. The current study was exempt from IRB review based on the use of a publicly available anonymized database.

2.2. Measures

2.2.1. Dependent variables

The main outcome variable in the current study, the usual cigar-type, was operationalized as the cigar type used most often. It was derived from the question, “During the PAST 30 days, what type of CIGAR did you use MOST OFTEN?” with the possible responses: “Regular,” “Cigarillos,” and “Little filtered cigars.” As the question was only asked of respondents who used large (regular) cigars, cigarillos, or little filtered cigars every day or some days at the time of the survey, an additional category, non-use, was created for those who were not asked this question.

2.2.2. Independent variables

Independent variables included sociodemographic characteristics and other tobacco product use. Sociodemographic characteristics included age (18–24, 25–34, 35–44, 45–54, or ≥55 years), sex (male or female), race (non-Hispanic White, non-Hispanic Black, Hispanic, or non-Hispanic other), employment status (full time, part time, unemployed, or not in the labor force), educational attainment (some high school or less, high school graduate or GED, some college [no degree] or associate degree, or at least bachelor’s degree), income (<$25,000, $25,000–$50,000, or ≥$50,000), and residential region (west, northeast, midwest, or south). Other tobacco use was defined as ever using other tobacco products even one time (i.e., e-cigarette, hookah or waterpipe, pipes, and smokeless tobacco such as moist snuff, dip, spit, chew tobacco, or snus) or smoking 100 cigarettes in their lifetime and now smoking cigarettes some days or every day (National Cancer Institute, 2020).

2.3. Statistical analysis

Sociodemographic characteristics for the four usual cigar types (large cigars, cigarillos, little filtered cigars, and non-use) are reported in Table 1. The weighted relative frequencies (column percentages) and 95% confidence intervals are reported for all categorical variables. Rao–Scott chi-square tests were used to compare the distribution of characteristics between usual cigar-type use. Multinomial logistic regression was used to assess the association between sociodemographic characteristics and usual cigar-type use (large cigars, cigarillos, and little filtered cigars) relative to non-use. Additional analyses were conducted to examine factors associated with using cigarillos or little filtered cigars relative to large cigars, given that cigar use is historically associated with older adults using traditional large cigars (Malone et al., 2001; Yogger et al., 2001). Analyses adjusted for age, sex, race, employment status, income, educational attainment, other tobacco use, and residential region. Adjusted odds ratios (AORs) and 95% confidence intervals (CI) were reported for multinomial logistic regression. In addition, stratified analyses were performed to examine the difference between male and female respondents given the documented gender difference in cigar use (Higgins et al., 2015; Cullen et al., 2011). Additional analyses examined findings among those who reported some day use (as opposed to every day use). Sampling weights were used in all analyses to account for the differential probability of sample selection and nonresponses. Detailed survey design methodology can be found in the CPS technical paper (Cohn et al., 2015). All tests were 2-sided, and p < 0.05 was considered significant. The listwise deletion was used to manage missing data. All analyses were performed using SAS, version 9.4.

3. Results

Among the 137,221 adults included in the study, 1467 (1.1%) used large cigars most often during the past 30 days before the survey, 513 (0.4%) used cigarillos most often, 446 (0.3%) used little filtered cigars most often, and the remaining 134,795 (98.1%) did not use large cigars, cigarillos, or little filtered cigars every day or some days at the time of the survey (see supplemental Table 1). Among those who usually used large cigars, about 92.6% were male, 74.9% were non-Hispanic White, and approximately 8.8% were aged 18–24 years. In contrast, among those who used cigarillos, 77.8% were male, 52.3% were non-Hispanic White, 30.3% were non-Hispanic Black, and 15.0% were aged 18–24. Among those who used little filtered cigars, 69.1% were male, 54.5% were non-Hispanic White, 28.4% were non-Hispanic Black, and 13.2% were 18–24 (Table 1). Among those who did not use cigars, 47.4% were male, 63.0% were non-Hispanic White, and 9.7% were 18–24. Sociodemographic characteristics differed significantly across the four cigar type groups. Additionally, over half of those who used cigars reported use of other tobacco products.

The multinomial logistic regression results on usual cigar-type use (large cigars, cigarillos, and little filtered cigars) with non-use as the base category are presented in Table 2. Results are adjusted for age, sex, race, employment status, income, educational attainment, other tobacco use, and residential region. Relative to non-use, we found males had significantly higher odds than females of using large cigars (AOR, 10.30, 95% CI, 8.04–13.19), cigarillos (AOR, 2.92, 95% CI, 2.24–3.80), and little filtered cigars (AOR, 2.02, 95% CI, 1.55–2.64). Likewise, those who used other tobacco products were more likely to use all cigar types. In addition, those living in the midwest region had significantly higher
Table 1
Descriptive statistics by usual cigar-type use.

|          | Large cigars | Cigarillos | Little filtered cigars | Non-use |
|----------|--------------|------------|------------------------|---------|
| N        | 1467         | 513        | 446                    | 134,795 |
| Age      |              |            |                        |         |
| 18–24    | 8.8          | 15.0 (9.7, | 13.2 (7.8,             | 9.7 (9.5,|
|          | (6.3, 11.3) | 20.4 (18.5)| 20.6 (15.8,            | 10.0    |
|          |              |            | (21.4, 25.5)           |         |
| 25–34    | 24.1         | 24.1 (19.3,| 28.9                    | 19.9 (19.6,|
|          | (21.4, 26.9)| 28.9        | 25.5                    | 20.1    |
| 35–44    | 16.9         | 16.8 (14.6,| 22.6                    | 16.3 (16.0,|
|          | (14.6, 19.1)| 22.6        | 21.2                    | 16.5    |
| 45–64    | 36.1         | 32.0 (27.2,| 36.9                    | 33.2 (32.9,|
|          | (33.2, 39.1)| 36.9        | 45.8                    | 33.5    |
| 65+      | 14.0         | 10.3 (7.8,  | 12.9                    | 11.9    |
|          | (12.2, 10.5)| (8.4, 12.9) | 21.0                    | 21.2    |
| Sex      |              |            |                        |         |
| Male     | 92.6         | 77.8 (73.4,| 60.1 (63.7,            | 47.4 (47.1,|
|          | (91.0, 94.3)| 82.2       | 74.5                    | 47.8    |
| Female   | 7.4          | 22.2 (17.8,| 30.9 (25.5,            | 52.6 (52.2,|
|          | (5.7, 9.0)  | 26.6       | 36.3                    | 52.9    |
| Race     |              |            |                        |         |
| Non-Hispanic White | 74.9 | 52.3 (46.7, | 54.5 (48.5,            | 63.0 (62.6,|
|          | (71.9, 77.9)| 57.9       | 60.5                    | 63.3    |
| Non-Hispanic Black | 10.6 | 30.3 (24.8, | 28.4 (22.5,            | 11.8 (11.5,|
|          | (8.5, 12.6) | 35.7       | 34.3                    | 12.0    |
| Hispanic | 10.3 (8.0,  | 12.5 (8.5,  | 11.7 (7.6,             | 16.7 (16.4,|
|          | 12.6)       | 16.6       | 15.8                    | 17.0    |
| Non-Hispanic Other | 4.3 | 4.8 (2.7,  | 5.4 (2.5,              | 8.5 (8.3,|
|          | (2.9, 5.7)  | 7.0        | 3.5                     |         |
| Employment status |            |            |                        |         |
| Full time | 68.0 | 55.5 (50.0, | 46.3 (40.5,            | 51.9 (51.5,|
|          | (65.2, 70.9)| 61.0       | 40.5                    | 52.2    |
| Part time | 6.7 | 10.8 (7.2,  | 10.8 (7.2,             | 10.9 (10.7,|
|          | (5.2, 8.3)  | 14.4       | 14.5                    | 11.1    |
| Unemployed | 3.5 | 8.3 (4.4,  | 5.4 (1.8,              | 2.8 (2.6,|
|          | (2.3, 4.6)  | 12.3       | 8.9                     | 2.9     |
| Not in labor force | 21.8 | 25.4 (21.1, | 37.4 (31.8,            | 34.5 (34.1,|
|          | (19.3, 24.2)| 21.1       | 43.1                    | 34.8    |
| Income   |              |            |                        |         |
| <$25,000 | 13.4         | 31.5 (26.2,| 38.8 (33.1,            | 18.3 (18.0,|
|          | (11.2, 15.0)| 36.8       | 44.5                    | 18.5    |
| $25,000–$50,000 | 17.3 | 23.1 (18.4,| 24.6 (19.6,            | 23.6 (23.3,|
|          | (14.9, 19.6)| 27.7       | 29.5                    | 23.8    |
| >$50,000 | 69.3         | 45.5 (40.0,| 36.7 (30.9,            | 58.2 (57.8,|
|          | (66.4, 72.2)| 51.0       | 42.5                    | 58.5    |
| Educational attainment |        |            |                        |         |
| Some high school or less | 7.1 | 13.4 (8.8,  | 16.1 (11.8,            | 9.7 (9.5,|
|          | (5.3, 8.9)  | 18.1       | 20.4                    | 9.9     |
| High school graduate or Ged | 21.3 | 33.8 (28.6,| 39.8 (34.1,            | 27.0 (26.7,|
|          | (18.7, 23.8)| 38.9       | 45.5                    | 27.3    |
| Some college or associate degree | 32.3 | 36.1 (30.8,| 30.8 (25.2,            | 29.3 (28.9,|
|          | (29.2, 35.3)| 41.5       | 36.5                    | 28.6    |
| At least bachelor’s degree | 39.4 | 16.7 (13.0,| 13.3 (9.5,             | 34.0 (33.7,|
|          | (36.3, 42.4)| 20.3       | 17.0                    | 34.3    |
| Other tobacco use | Yes | 54.8 | 58.5 (53.0,            | 53.5 (47.6,|
|          | (51.7, 57.9)| 63.9       | 59.4                    | 16.3 (16.1,|
|          |              |            | 16.6                    |         |
| No      | 45.2         | 41.5 (36.1,| 46.5 (40.6,            | 83.7 (83.4,|
|          | (47.0)      | 52.4        | 83.9                    |         |

4. Discussion
This 2018–2019 TUS-CPS data analysis identified significant sociodemographic differences based on usual cigar-type use. Characteristics of those who usually used large cigars differed significantly from those who usually used cigars, little filtered cigars, or reported no cigar use. These findings extend previous work in this area and have important implications for practice.

We identified differences in usual cigar-type use by race, income, education, and other product use. Non-Hispanic Black adults were more likely to use all cigar products and then more likely to prefer cigarillos.
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and little filtered cigars than large cigars compared with non-Hispanic White adults. Multiple studies have reported higher rates of cigarillo and little filtered cigar use among Black adults (Corey et al., 2014; Borawska et al., 2010; Chen-Sankey et al., 2021). As noted previously (Weinberger et al., 2002), while cigar use rates among non-Hispanic White adults and Hispanic adults have declined, cigar use rates among Black adults have not. Non-White communities have been targeted by the tobacco industry, with more advertisements and lower prices which likely helps account for increases in use among these populations (Cantrell et al., 2013; Smiley et al., 2019). We found that Hispanic adults and adults of other races had lower odds than White adults for large cigar use relative to non-use. This is similar to another study that found that the prevalence was lowest among adults of other non-Hispanic races compared to other racial groups regardless of cigar type (Chen-Sankey et al., 2021). In the present study, the non-Hispanic other category was predominantly Asian, though lower use rates prevented us from establishing a standalone category. However, the findings of this group suggest that research with larger samples to allow parsing out this population might be warranted.

This study also found that those with higher income and educational attainment were less likely to use cigarillos and little filtered cigars, which echoes previous findings and suggests low-income individuals remain a priority population (Corey et al., 2018; Borawski et al., 2010; Corey et al., 2014). Increasing price and minimum pack sizes may effectively reduce use among this population (King et al., 2020; Persoskie et al., 2019). These findings also highlight that it might be beneficial to target prevention efforts to particular subgroups, given that cultural values and socioeconomic status may influence cigar use (Nguyen, 2019; Srinivasan and Guillermo, 2000). Lastly, other tobacco use was common among those reporting cigar use and increased the odds of all types of cigar use.

Multinomial logistic regression was used to assess the factors associated with the usual cigarillos and little filtered cigars use relative to large cigars adjusting for age, sex, race, employment status, income, educational attainment, other tobacco use, and residential region. Adjusted odds ratios (AORs) and 95% C.I.s were reported.

Table 2

Multinomial logistic regression on usual cigar-type use relative to non-use, N = 137,221.

| Age       | Large cigars vs. non-use | Cigarillos vs. non-use | Little filtered cigars vs. non-use |
|-----------|--------------------------|------------------------|-----------------------------------|
| 18–24     | Ref                      | Ref                    | Ref                               |
| 25–34     | 1.05 (0.74, 1.48)        | 0.87 (0.54, 1.39)      | 0.98 (0.58, 1.67)                 |
| 35–44     | 0.97 (0.68, 1.37)        | 0.98 (0.61, 1.56)      | 1.13 (0.66, 1.95)                 |
| 45–64     | 1.09 (0.78, 1.51)        | 0.90 (0.58, 1.38)      | 1.25 (0.76, 2.04)                 |
| 65+       | 0.75 (0.52, 1.07)        | 0.50 (0.31, 0.79)      | 0.36 (0.20, 0.63)                 |

Table 3

Multinomial logistic regression on usual cigar-type use, with large cigar use as the referent group, N = 137,221.

| Age       | Cigarillos vs. Large Cigars | Little filtered cigars vs. Large Cigars |
|-----------|-----------------------------|----------------------------------------|
| 18–24     | Ref                         | Ref                                    |
| 25–34     | 0.83 (0.47, 1.49)           | 0.94 (0.50, 1.76)                      |
| 35–44     | 1.01 (0.56, 1.81)           | 1.17 (0.62, 2.23)                      |
| 45–64     | 0.82 (0.48, 1.41)           | 1.15 (0.64, 2.06)                      |
| 65+       | 0.66 (0.37, 1.19)           | 0.48 (0.25, 0.94)                      |

Multinomial logistic regression was used to assess the association between sociodemographic characteristics and usual cigar-type use (large cigars, cigarillos, and little filtered cigars) relative to non-use adjusting for age, sex, race, employment status, income, educational attainment, other tobacco use, and residential region. Adjusted odds ratios (AORs) and 95% C.I.s were reported.
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Table 4 Multinomial logistic regression on usual cigar-type use with large cigars as the referent group, stratified by sex.

| Age            | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
|----------------|-----------------------------|----------------------------------------|
|                | Male | Female | Male | Female | Male | Female |
| 18–24          | Ref   | Ref    | Ref   | Ref    | Ref   | Ref    |
| 25–34          | 0.63 (0.32, 1.23) 1.03 (0.50, 2.15) | 0.52 (0.11, 2.41) |
| 35–44          | 1.06 (0.55, 2.03) 2.10 | 1.46 (0.70, 2.97) |
| 45–64          | 0.82 (0.45, 2.03) 2.47 | 1.38 (0.73, 2.55) |
| 65+            | 0.70 (0.37, 1.50) 3.26 | 0.55 (0.27, 1.02) |

Race

| Race                   | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
|------------------------|-----------------------------|----------------------------------------|
| Non-Hispanic White     | Ref | Ref | Ref | Ref |
| Non-Hispanic Black     | 5.96 (2.63, 1.49) 2.63 | 1.07 (0.49, 2.35) |
| Hispanic               | 1.59 (0.88, 0.79) 0.59 | 1.26 (0.08, 1.08) |
| Non-Hispanic Other     | 1.78 (0.87, 2.07) 2.07 | 0.86 |
| Employment status      | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
| Full time              | Ref | Ref | Ref | Ref |
| Part time              | 2.11 (1.06, 4.30) 3.13 | 0.14 (0.51, 2.39) |
| Unemployed             | 2.08 (1.08, 3.37) 4.20 | 2.35 |
| Not in labor force     | 0.92 (0.60, 2.15) 1.86 | 0.83 |
| Income                 | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
| <$25,000               | Ref | Ref | Ref | Ref |
| $25,000–$50,000        | 1.99 (1.33, 1.76) 1.72 | 4.12 (1.60, 7.10) |
| >$50,000               | Ref | Ref | Ref | Ref |
| Education attainment   | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
| Some high school or less | 3.10 (1.68, 1.07) 3.86 | 3.14 (0.43, 7.73) |
| High school graduate or GED | 2.72 (1.83, 4.58) 4.21 | 2.14 (0.81, 4.72) |
| Some college or Associate degree | 1.81 (1.23, 4.59) 2.25 | 3.59 (1.43, 9.01) |
| At least bachelor’s degree | Ref | Ref | Ref | Ref |
| Other tobacco use       | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
| Yes                    | 1.50 (1.10, 1.69) 1.93 | 1.26 (0.66, 2.41) |
| No                     | Ref | Ref | Ref | Ref |
| Region                 | Cigarillos vs. Large cigars | Little filtered cigars vs. Large cigars |
| West                   | Ref | Ref | Ref | Ref |
| Northeast              | 0.82 (0.47, 1.07) 1.11 | 0.34 (0.43, 4.17) |
| Midwest                | 1.31 (0.84, 1.45) 1.38 | 1.88 |
| South                  | 1.04 (0.68, 0.69) 1.56 | 1.14 (0.50, 2.59) |

Multinomial logistic regression was used to assess the factors associated with the usual cigarillos and little filtered cigars use relative to large cigars, adjusting for age, race, employment status, income, educational attainment, other tobacco use, and residential region. Adjusted odds ratios (AORs) and 95% C.I.s were reported.

However, it was even more pronounced among those who usually use cigarillos and little filtered cigars. This corresponds to other literature that has found some little cigars to be used as substitutes for cigarettes (Corey et al., 2018; Delnevo et al., 2017). Effective messaging on the harms of polytobacco use is needed.

Cigars lack the policy, prevention, and cessation efforts to reduce use, despite similar risks compared to combustible cigarettes. The findings from this nationally representative analysis of 2018–2019 TUS-CPS highlight potential areas for targeted efforts, including education on the risks of polytobacco use, broadening prevention and clinician assessment efforts across age groups, and continued efforts to implement policies that reduce the disproportionate rates of use among minoritized and low-income populations.

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CRediT authorship contribution statement

Sunday Azagba: Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing - original draft, Writing - review & editing. Jessica L. King: Funding, Writing - original draft, Writing - review & editing. Lingpeng Shan: Formal analysis, Writing - review & editing.
Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.pmedr.2021.101560.

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