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INTRODUCTION

Improvements in life expectancy are often attributed to improvements in quality of life and in healthcare. Timely access to treatment can often improve health and prolong life. However, the impact of increasing access to medication on prolonging the age of death in Brazil is still unknown. This study aimed to assess the association between public health system-dispensed medication and the mean age of death in Brazil from 2011-2019.

METHODS

Retrospective database study of anonymized microdata from the Brazilian Ministry of Health. Information on mean age of death was obtained from the Brazilian Mortality Information System, while hospitalization details were extracted from the Hospitalization Information System. Prais-Winsten regression were used to estimate Monthly Average Percentage Change (MAPC). We created a panel using month and disease categories as the panel units. Fixed-effect regression models were used to control for potential confounders. It is important to highlight that the results may be underestimated, since the medication dispensed data are only from the public health system, while death data are from public and private health system.

RESULTS

- Dispensed medication increased for all disease groups, except for skin and subcutaneous tissue diseases (MAPC -15.7 [95 IC -31, -0.4]) and neoplasms (MAPC -14.3 [95 IC -27.7, -1]) (Table 1).
- Largest increases were seen in circulatory system diseases (MAPC 217.4 [95 IC 123.8, 311.9]) and blood-related disorders (MAPC 73.7 [58.8, 88.6]) (Table 1).
- Unspecified diseases showed a MAPC of 190.3 [95 IC 164.2, 216.5] (Table 1).
- Mean age of death increased for all significant disease groups, more notably in infectious and parasitic diseases (12.1) and the nervous system (9.7). with the exception of unknown or not specified diseases (1.1, -0.1 to 2.4) (Figure 1).
- A significant positive correlation was detected between dispensed medication and mean age of death (Coef 0.00529; StdErr 0.00127), even after adjusting for hospitalization-related factors and disease categories (Figure 2).

Table 1. Mean rate of dispensed medications in the public health system by years and disease group from 2011-2019.

Disease group	2011	2015	2019	MAPC
Circulatory system (I00-I99)	9.9	63.3	79.3	217.4 [123.8, 311.9]
Digestive system (K00-K93)	161.6	228.3	277.8	58.1 [50.7, 65.6]
Blood and blood-forming organs (D50-D89)	28.6	37.8	57.9	73.7 [58.8, 88.6]
Infectious and parasitic diseases (A00-B99)	86.5	120.0	166.0	67.2 [52.3, 82.1]
Mental, Behavioral and Neurodevelopmental (F00-F99)	704.1	922.1	1319.6	70.9 [63.9, 77.8]
Endocrine, nutritional and metabolic (E00-E90)	970.5	1158.3	1291.0	28.3 [21.7, 34.8]
Musculoskeletal system and connective tissue (M00-M99)	659.7	795.8	954.3	41.1 [35.5, 46.6]
Neoplasms (C00-D48)	13.9	13.4	11.8	-14.3 [-27.7, -1]
Nervous system (G00-G99)	758.8	884.5	879.7	16.1 [9.1, 23.1]
Unknown or not specified (R00-R99)	32.6	93.5	190.2	190.3 [164.2, 216.5]
Respiratory system (J00-J99)	557.0	767.7	939.3	55.7 [47, 64.3]
Skin and subcutaneous tissue (L00-L99)	146.8	144.4	116.6	-15.7 [-31, -0.4]
Genitourinary system (N00-N99)	498.7	550.9	631.3	27.1 [21.9, 32.3]

Figure 1. Mean age of death

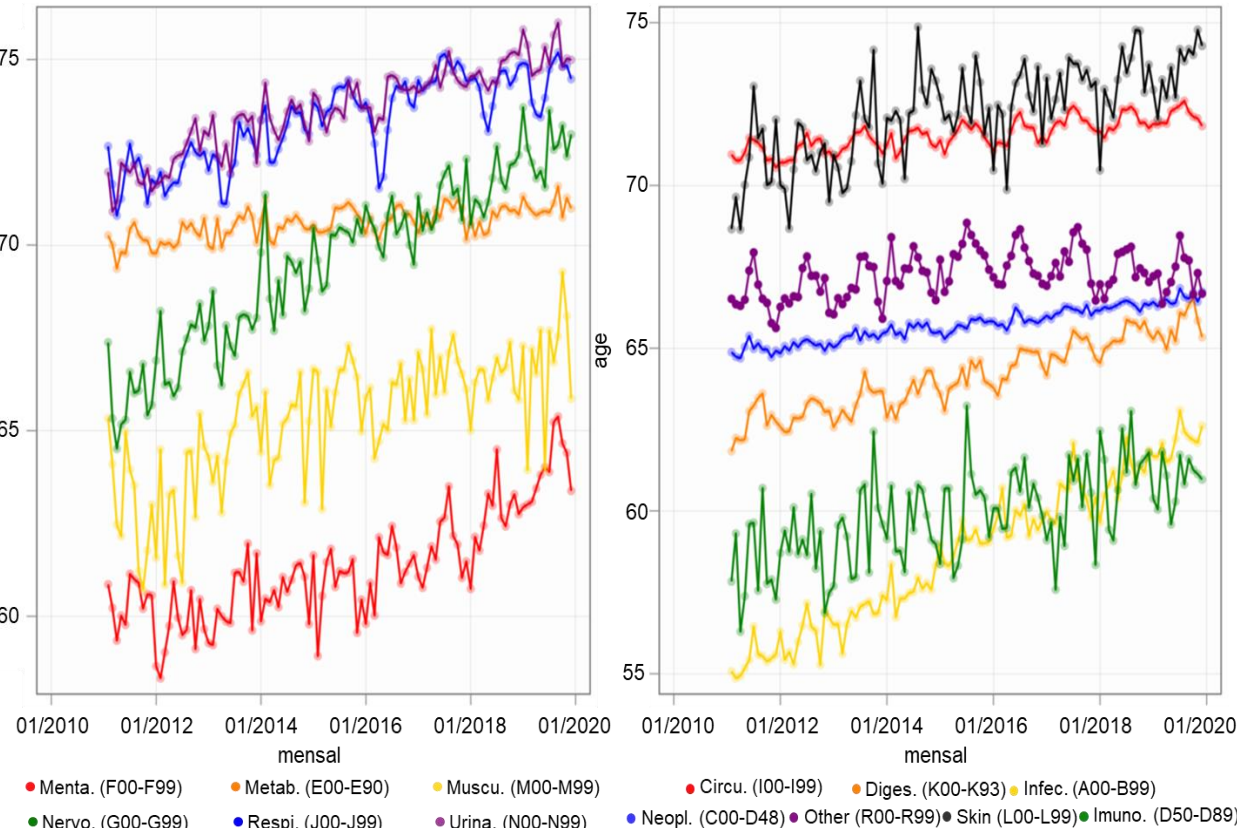
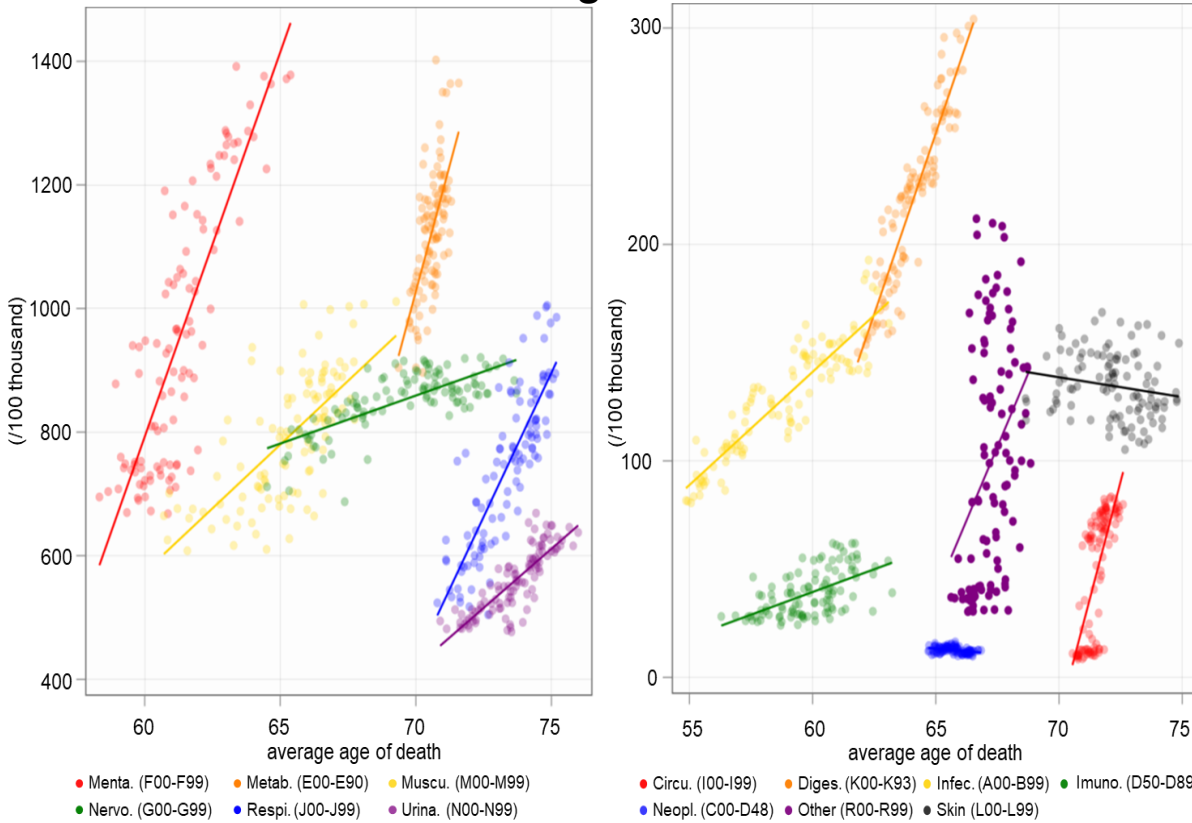


Figure 2. Relationship between dispensed medication rate and mean age of death



Conclusion

Dispensed medication in Brazil increased from 2011-2019, possibly contributing to a modest rise in life expectancy. Improving access to medication in the public health system may increase the mean age of death, indicating improved health outcomes.

Further study is essential to understand the private health care system's influence on the connection between dispensed medication and the mean age of death for specific disease groups.