Stats analysis of dementia drugs by region:

Exploratory Data Analysis (Dementia)

Auto-correlation plots – to see stationarity – No stationarity (region or total)

1. Not stationary (Total) (Indicative of some seasonality)A screenshot of a cell phone

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ADF – test:

Test statistic = -0.051

P-value = 0.954

2-month differencing

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Test statistic = -6.139

P-value = 0.000

Heatmap for dementia:

A picture containing text, map

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Spatial correlation results:

Dementia

Top 3 categories – 06,01,04 - Endocrine, Gastro-intestinal, CNS (excl. Dementia)

0605', '0105', '0403

A picture containing text, map

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A picture containing text, map

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Time density plots (for region with max drug quantity)

0403 - E38000129

0105 - E38000222

0605 - E38000129

0411 - E38000225

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Time density plots (across regions corrected by std)

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Shapiro -

0403 (0.9995211362838745, 0.6146018505096436)

0605 (0.9832905530929565, 2.390777344683428e-21)

0411 (0.99250328540802, 1.188542536958992e-13)

KS test (after subtracting mean/variance)

KstestResult(statistic=0.029065241698383204, pvalue=2.353609114020773e-20)

Regional/Temporal effect of change in distribution – from normal to – non-normal – possible increase in dementia cases – comes from

Investigated by looking at KS-test for various regions and time

Region showing significant deviation from normal distribution in dementia -

E38000104

E38000210

E38000214

E38000227

Around (2018-2019)

A close up of a map

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Significant increase in kent (compared to other regions)

Similar variation in 0302,2012,1914  
  
  
  
  
  
Summary:

Dementia – long term causation, long term effects, potential seasonality - <https://jamanetwork.com/journals/jama/fullarticle/2711040>

But, nothing came up in ACF – minor correlation in lagged period of 2 months on total – no significant seasonal effects in prelim analysis

Spatial variation of dementia investigated

Compared to spatial variation for other drugs prescribed - clear pattern – top three categories are CNS, Gastro-intestinal and Endocrine drugs

Time density plots indicate largely normal distribution (over 3 years, across regions) – statistical tests however fail for 0411 – which stems from variation in kent region (around 2017-2019).

Similar variation analysis done to identify anomalous behaviour – 0302,2012,1914 showed similar change only in kent region – couldn’t correlate (but 0302 – (steroids) can induce dementia??) – maybe the GP in kent fucked up