Supplementary of Cartographic Treemaps for Visualization of Public Health Care Data

Figure 2: This graph shows the original 209 CCG regions (Clinical Commissioning Groups) provided by Public Health England [1].Only 18% of screen space is covered by a traditional map.

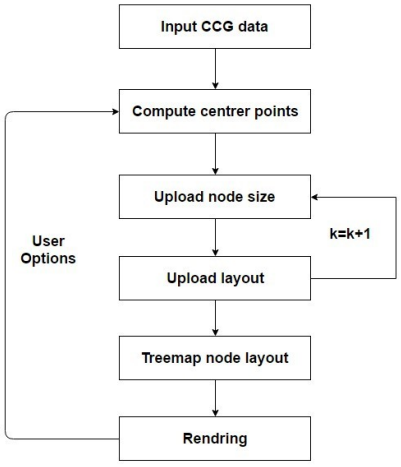

Figure 3: This is the processing pipeline for producing cartographic treemaps. k is the counter used to gradually expand each region node during node layout.

REFERENCES

[1] NHS. https://www.england.nhs.uk/resources/ccg-maps/.

[2] QGIS. http://www.qgis.org/en/site/.

[3] Disk Inventory X. http://www.derlien.com/.

[4] Vidya Setlur and Maureen C Stone. A Linguistic Approach to Categorical Color Assignment for Data Visualization. *IEEE Transactions on Visualization and Computer Graphics*, 22(1):698–707, 2016.

[5] ColorBrewer. http://colorbrewer2.org/.

[6] Alexandru C Telea. *Data Visualization: Principles and Practice*. CRC Press, 2014.

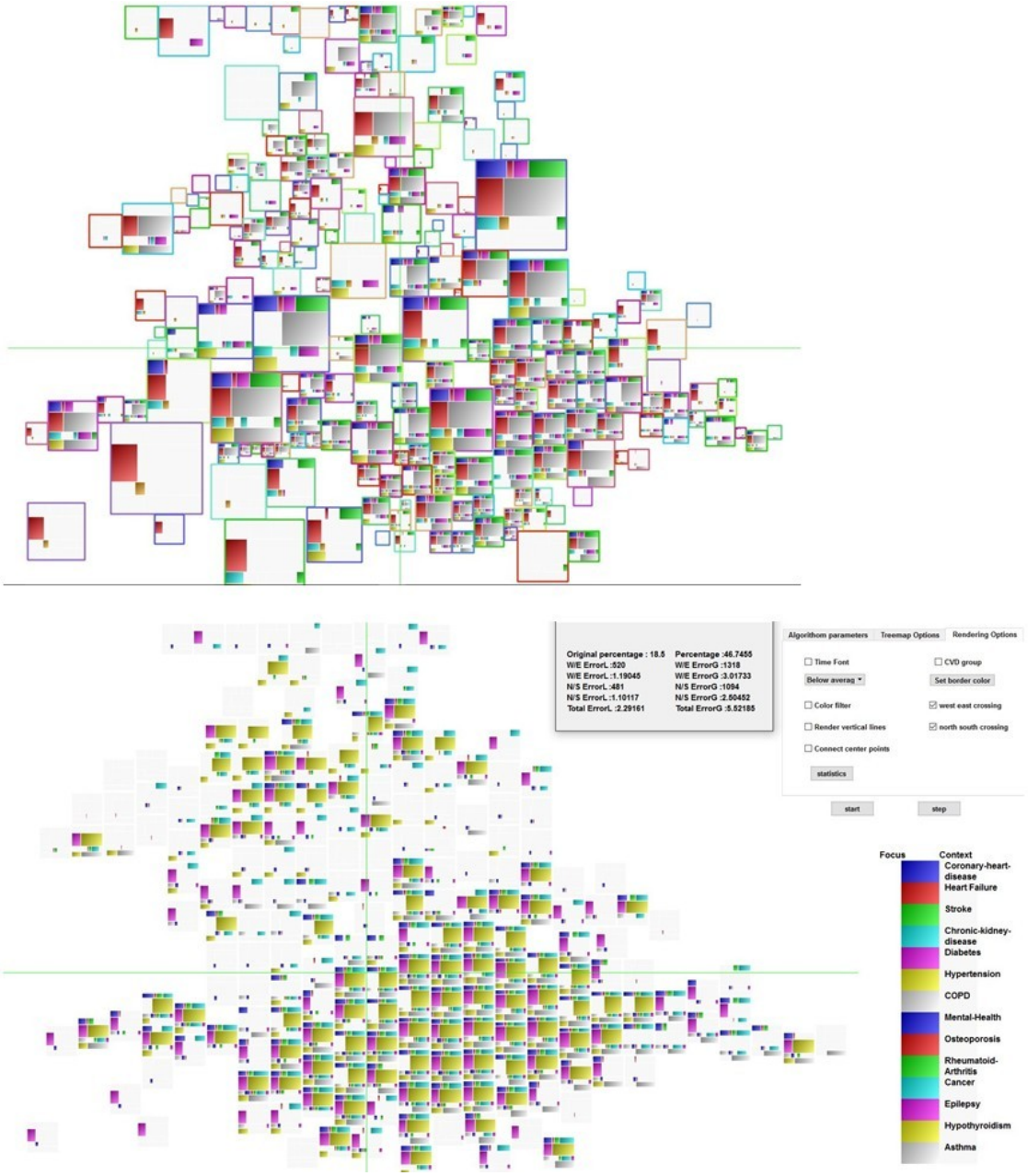

Figure 1: This graph shows each region size proportional to its population with an added below average filter (top). The percentage of screen space occupied, s_0 = 41% and the local error, e_l = 3.5%, e_g=8.7% and uniform size output with a below average filter (bottom). s = 47%, e_l = 2.3%, and e_g = 5.5%. All the health care disorders that exhibit higher than average prevalence are filtered and shown as grey context. Note how the London region is healthier with the exceptions of diabetes and mental health. This is an observation based on multiple variates that would be difficult to make otherwise.

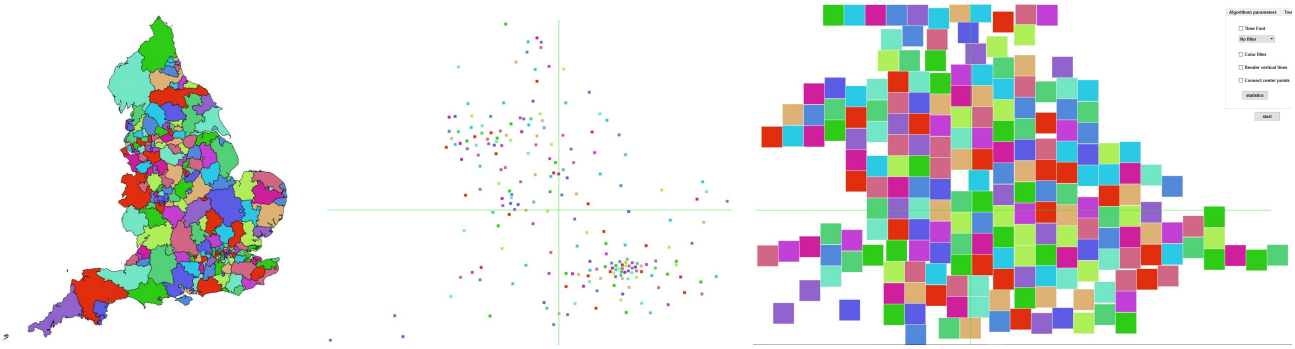

Figure 4: *This figure shows the original CCG map (left) filling 18% of screen space. The resulting region node layout with 1% error (middle) and the output with 60% space filling and 6.6% error(right). These use the QGIS color map [2].*

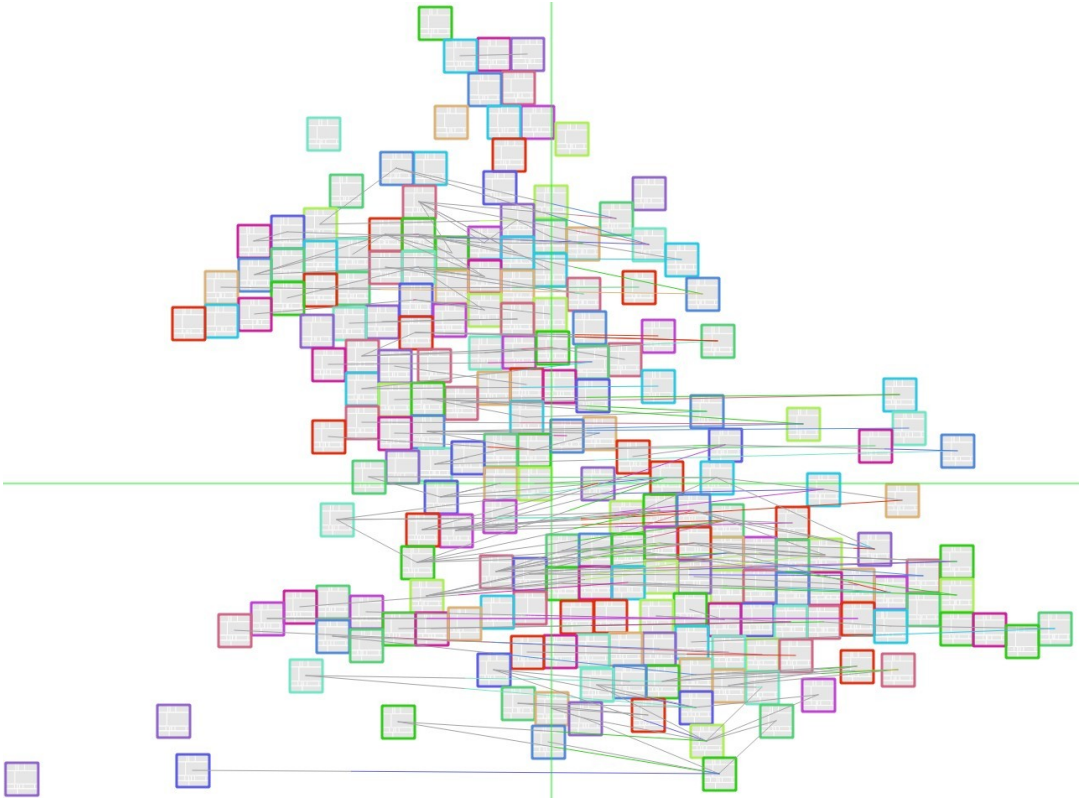

Figure 5: Visualization of errors: This figure shows error crossing edges in north and south orientation. The screen space-filling percentage, s, is 20% and e_l is 0.9%, and e_g is 1.8%.

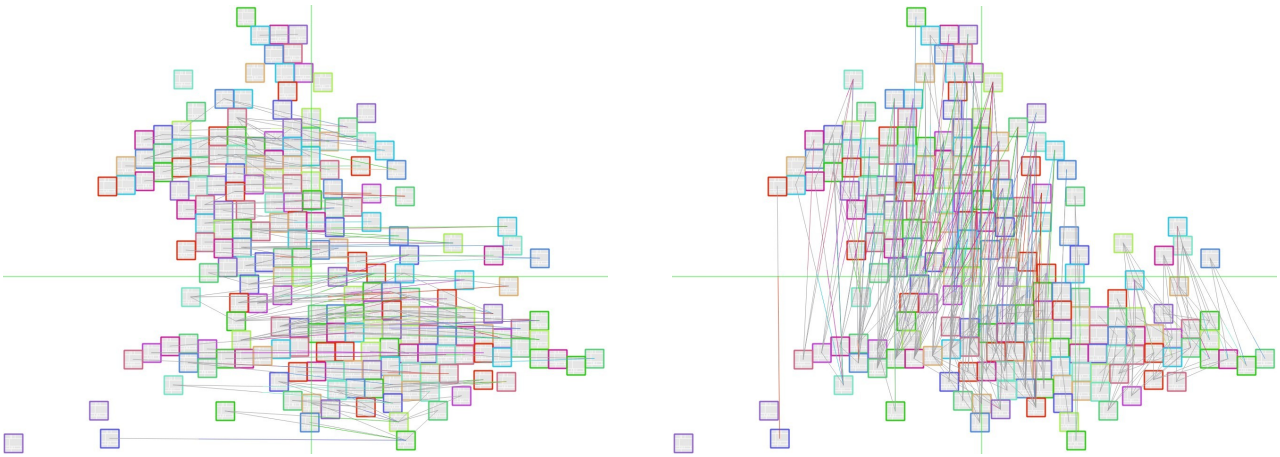

Figure 6: *Visualization of errors: This figure shows error crossing edges in north and south orientation (left), in west and east orientation (right). The screen space-filling percentage, s, is 20% and e_l is 0.9%, and e_g is 1.8%.*

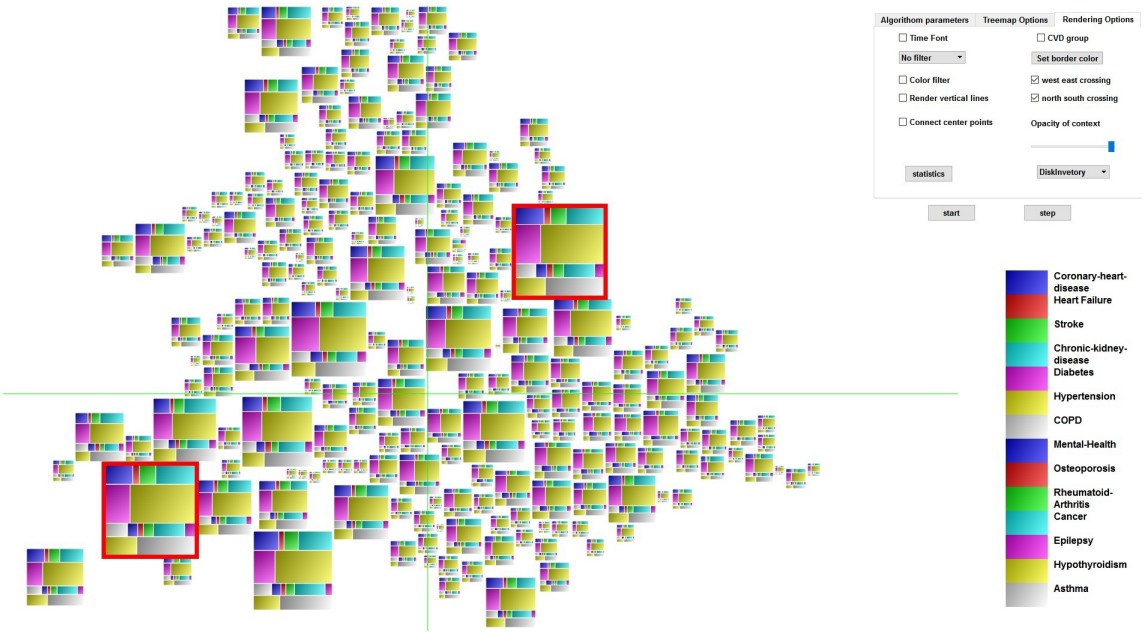

Figure 7: Nodes proportional to CCG size. The screen space-filling percentage, s=36% and e_l=2.4%, e_g = 4.5. The two red outlines show the two biggest region nodes on the map: Cambridgeshire Peterborough and North East & West Devon. This is unexpected since we hypothesized the largest regions to be in London or Birmingham. This example uses color map from the disk inventory X tool [3].

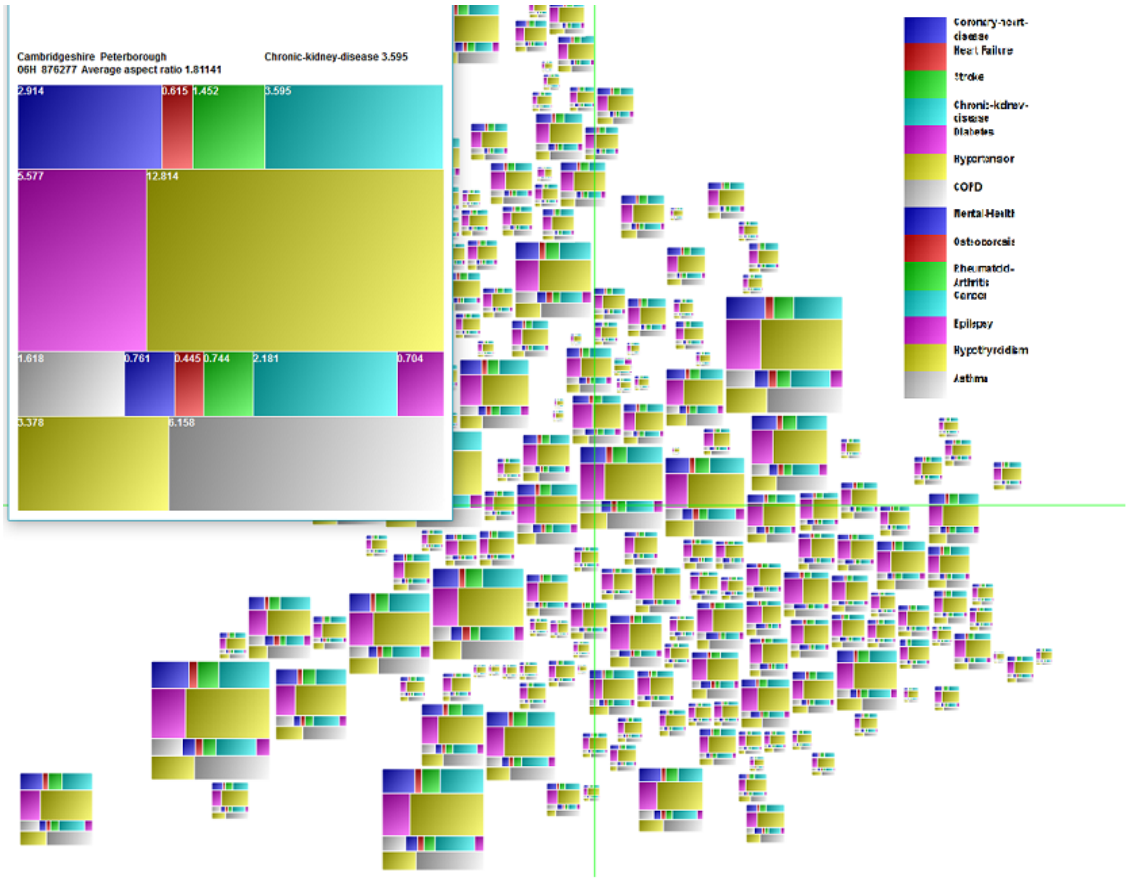

Figure 8: This visualization shows the output of cartographic treemap with region size proportional to population, and with a details-on-demand window for one region node. s=30%, e_l=2.4% and e_g= 5.1%. The first three rectangles in each region node represent three CVD health disorders. Note the prevalence of hypertension and diabetes is very widespread the UK. This type of multivariate observation display itself clearly with this type of visualization.

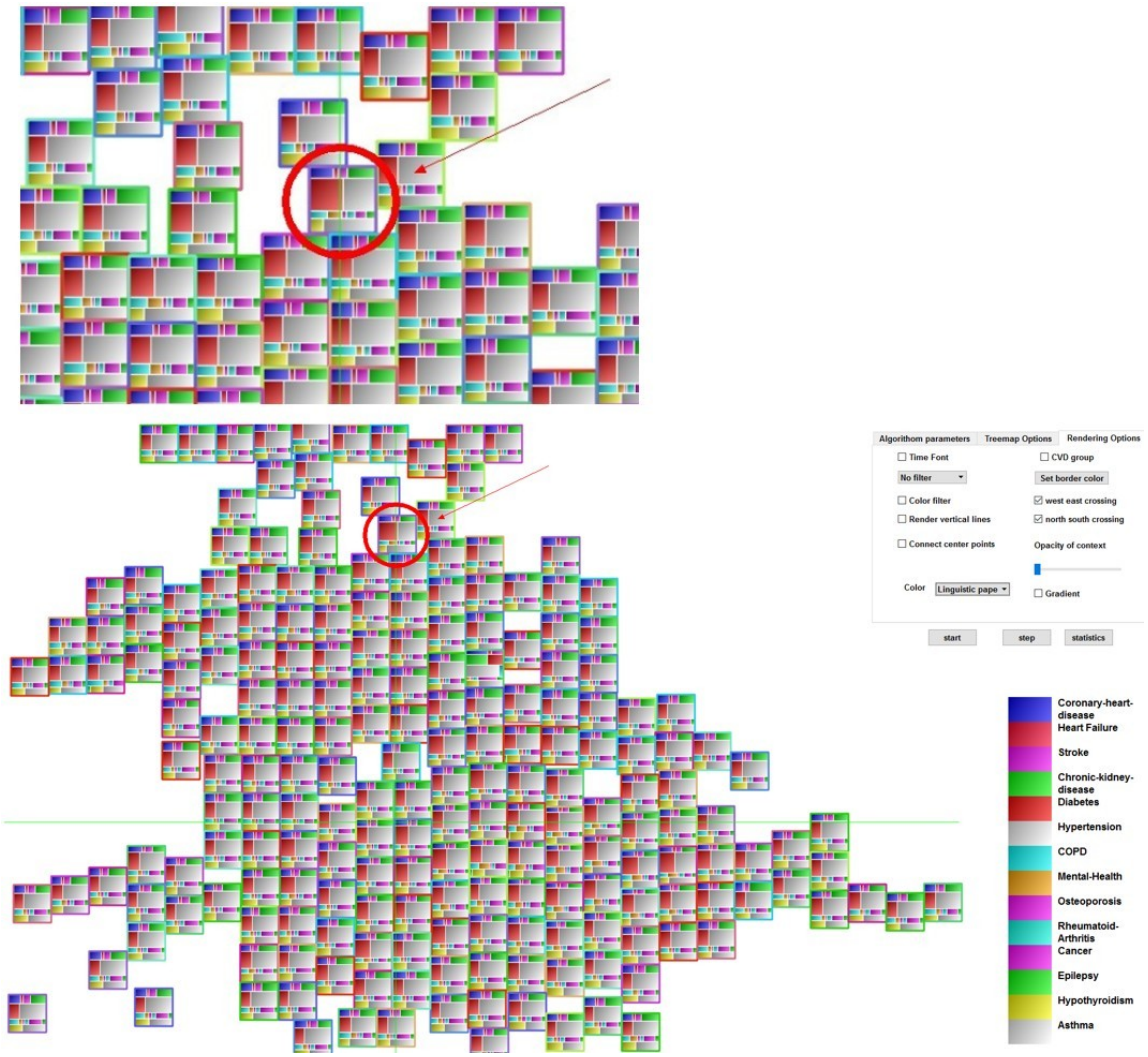

Figure 9: This graph shows the output of cartographic treemap with uniform size region nodes. s=50% and e_l=2.4%, and e_g=5.8%. The region with the red circle (Bradford City) contains the largest purple rectangle which indicates the highest relative prevalence of diabetes in the UK. This example uses Setlur and Stone's color map [4].

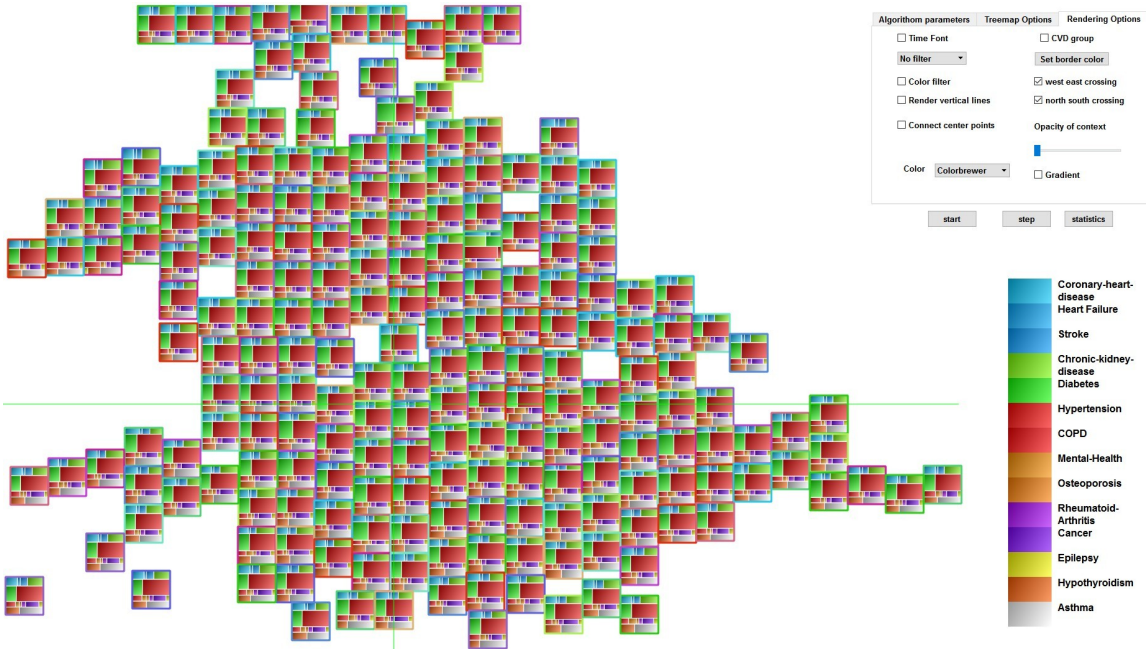

Figure 10: This graph shows the cartographic treemap using average difference maps. s=50%, e_l=2.4%, and e_g=5.8%. The larger a bottom level rectangle is, the more it deviates from the UK average. This example uses the color map from color-brewer [5].

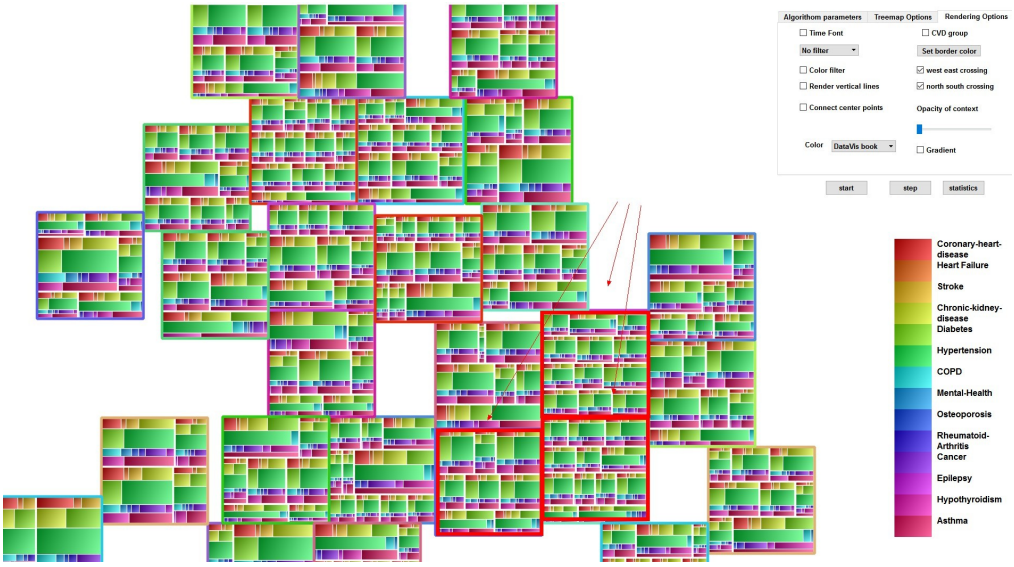

Figure 11: This graph shows the cartographic treemap with 27 area groups. s= 70% and e_g = 5.2% . The regions in red highlights are London areas. This example uses Telea's color map [6].

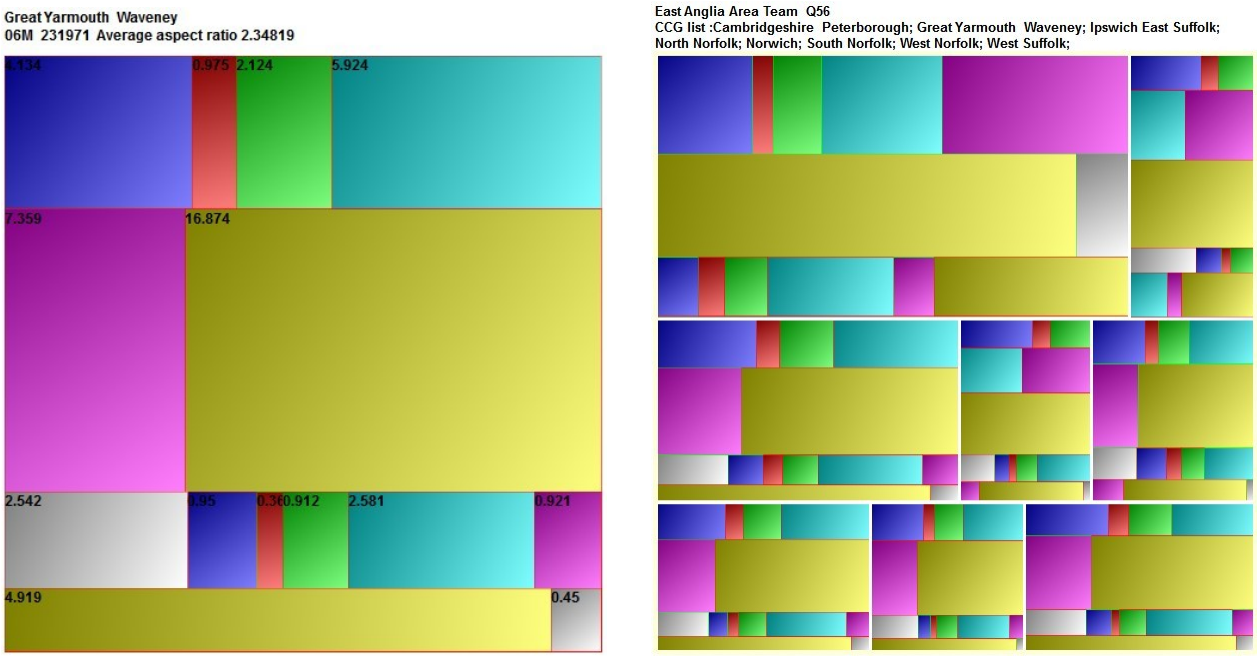

Figure 12: This figure shows the details-on-demand output map of one region (left) and detailed output of one area group (right).

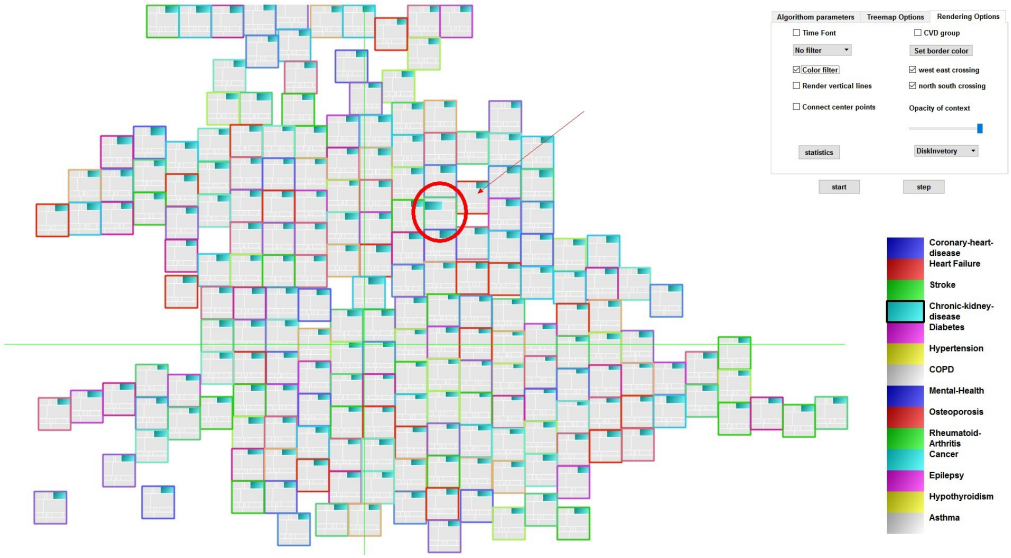

Figure 13: A focus+context cartographic treemap visualization with uniform size regions. s=50%, e_l=2.4%, and e_g=5.8%. The data is mapped to two color scales: one for the focus data and the other for context. All the health care prevalence categories are shown as context except for user selected data attributes. The red circle shows the relatively largest rectangle in the map that represents the highest prevalence of Chronic-kidney-disease disorder in the UK (Nottingham North And East).

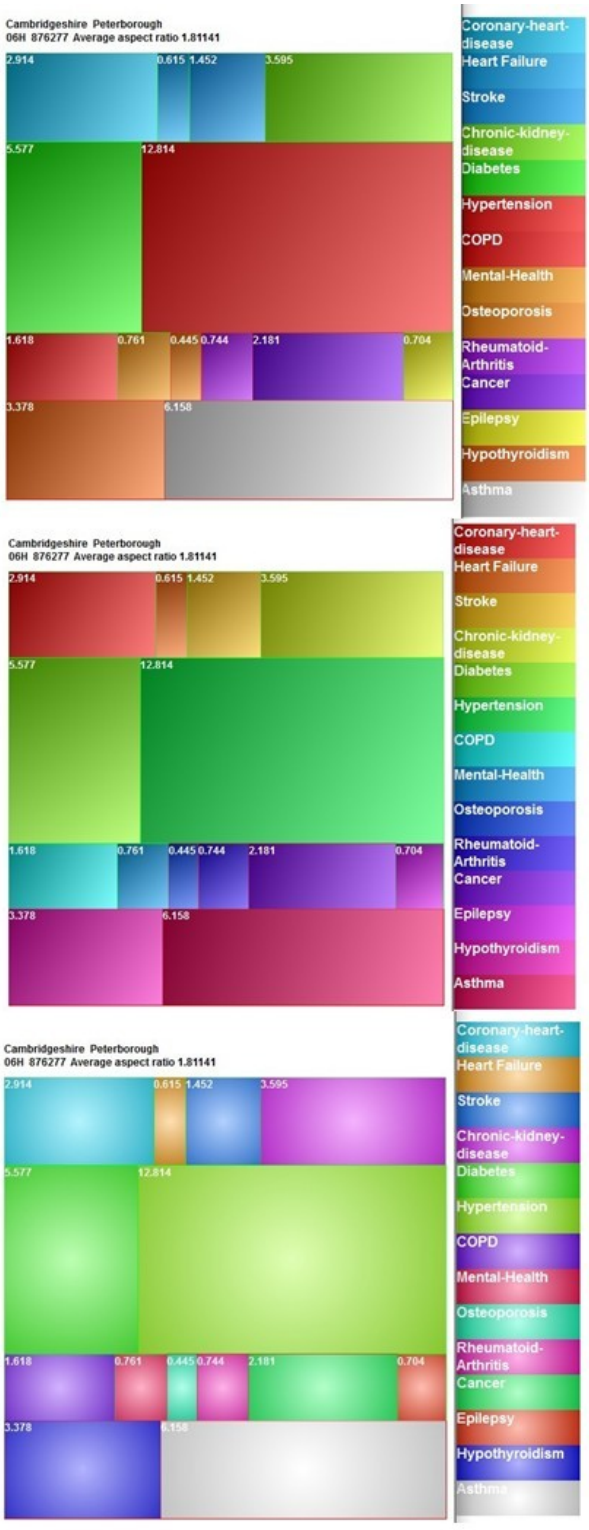

Figure 14: This figure illustrates some different color and gradient mapping options. The color legend of the top treemap is from ColorBrewer [5] . The middle one is from Telea [6]. The bottom one is from QGIS [2] with an added color gradient.