ECHO

EUROPEAN COLLABORATION FOR HEALTHCARE OPTIMIZATION

Potentially Avoidable Hospitalisations in Denmark

I. EXECUTIVE SUMMARY

The study of systematic variations in Potentially Avoidable Hospitalizations (PAH) offers a critical view on how healthcare organizations provide care to patients with chronic conditions. In particular, it signals how effectively they are managed in the ambulatory setting

- Potentially Avoidable Hospitalisations (PAH) are defined as admissions due to acute deterioration of a chronic patient which could have been avoided with effective ambulatory care. Therefore, high PAH rates can be interpreted as potential shortcomings in ambulatory management of chronic conditions.
- This report analyses the magnitude and the variation in unplanned hospitalisations from six chronic conditions highly sensitive to ambulatory care: angina, adult asthma, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), dehydration and diabetes short-term complications, as well as an additional indicator aggregating admissions for all 6 conditions (All PAH).
- Denmark shows the highest rate of potentially avoidable hospitalisations – 1 admission per 131 adult inhabitants in 2009. That means a 2.6-fold difference with respect to the ECHO country with the lowest rate, Portugal.
- In 2009, 35,052 discharges were flagged as Potentially Avoidable Hospitalization (PAH) in Denmark, -2.1% of all hospitalisations that year.
- The condition-specific rates ranged from one admission per 6,289 individuals over 40 years old in the case of short-term complications in diabetes to one admission per 133 individuals over 65 in the case of dehydration
- Differences across the 98 kommuners in the country were patent. Residents in kommuners with the highest standardised rates experienced twice as many all PAH than those with the lowest; as for specific conditions, the proportion ranged from 7.9-fold rate in the case of diabetes short-term complications to 2.5-fold in COPD.
- Moreover, a significant proportion of that variation was systematic -not amenable to chance- and often increasing over time. The highest systematic variation across kommuners was detected for urgent angina admission (33%), whereas the lowest variation corresponded to COPD (5%).
- Living in a particular Region –i.e. different regional policies- was a factor clearly contributing to explain variation (up to a 48%), particularly in the cases of CHF and angina admissions. This suggests a potential relevant role of regional policy to improve chronic conditions management.

- Along the period 2002-2009, rates of the aggregated potentially avoidable hospitalisations decreased by 16%, from 97 to 82 admissions per 10,000 inhabitants. However, systematic variation remained stable over this period around 6%.

- Dehydration showed an increase of 74%, moving from 1 admission per 197 elderly in 2002 up to 1 in 113 inhabitants aged 65 or older in 2009. These rates are far upwards from those observed in other ECHO countries.

- When comparing PAH rates across socioeconomic levels, neither all PAH nor specific-condition rates showed significant differences between better-off and most deprived areas over the period 2002-2009. Dehydration admissions might be the only exception, with analysis suggesting a significant widening of the gap in 2009, when people living in wealthier kommuners experienced higher admission rates than residents in less affluent areas.

- In the context of ECHO project, the study of PAH might be considered as a proxy of how effectively and efficiently healthcare organizations in a particular area provide care for chronic patients –the combination of specialised, primary and long term care providers to whom populations are exposed. Thus, studying PAH would imply investigating whether population is exposed to effective primary care, effective continuity of care between primary and specialised levels and good coordination with long-term services (home care, day care, long term care facilities, etc…)

Relatively high rates of potentially avoidable hospitalisations (PAH) should be considered as a symptom of shortcomings in the ambulatory management of chronic patients, warranting assessment of elements such as the existing pathways, mix of providers available and coordination and continuity of care for these patients.

In the case of the Danish Healthcare System, the detected high rates of PAH might indicate higher reliance on in-hospital settings than in the other ECHO countries; this poses some questions as to whether there is room for a shifting to community and primary care resources which may improve effectiveness and efficiency of care for chronic conditions.

II. INTERNATIONAL COMPARISON

Different healthcare systems across Europe, with different organizational features, might obtain different outcomes in chronic care

This section offers a rough picture of potentially avoidable hospitalisations in Denmark, in comparison with what happens in the other ECHO countries. Two insights to be retained: the magnitude of the phenomenon, and the variation across the areas.

Overall potentially avoidable hospitalisations (PAH)

Denmark shows the highest rate of potentially avoidable hospitalisations – 1 admission per 131 adult inhabitants in 2009. That means a 2.6-fold difference with respect to Portugal, the country with the lowest rate- 1 admission per 364 adult inhabitants in 2009 (see appendix 1 table 1).

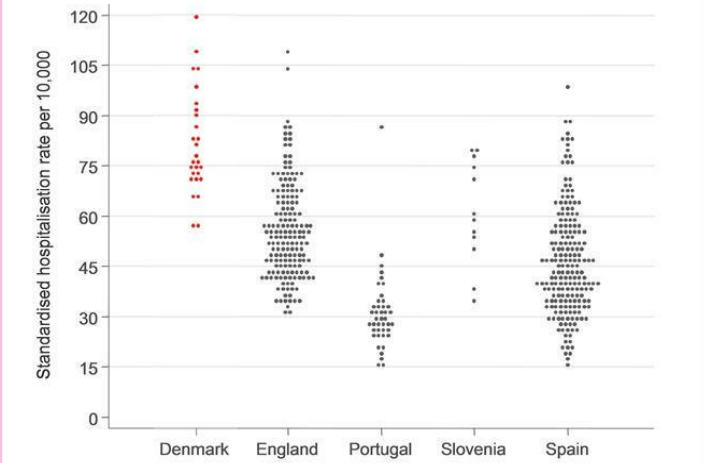

Figure 1.a. Age-sex standardised overall PAH rates per 10,000 inhabitants (natural scale to compare actual rates). Year 2009

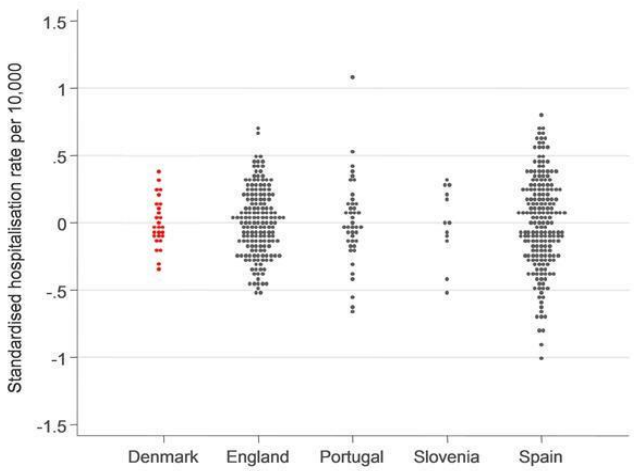

Figure 1.b. Age-sex standardised overall PAH rates per 10,000 inhabitants (normalised scale to compare degree of variation). Year 2009

** Each dot represents the relevant administrative area in the country (Kommuners for Denmark). The y-axis charts the standardised rate per 10,000 inhabitants (+18 age) The figure is built on the total number of interventions in 2009. The population of reference for standardization was 2002 ECHO pooled population. Looking at figure 1.a, the reader will get a sense of the magnitude of PAH in each country whereas figure 1.b provides a picture of the degree of variation across countries*

Conversely, the ratio between the highest and lowest PAH rate found at local level is the lowest: almost 2-folded chance of undergoing PAH for residents in those kommuners with the highest rates. Similar ratios between areas with

extreme rates are detected in Slovenia, England and Portugal. Only in Spain the ratio increases to more than 3 times.

In Denmark, systematic variation (SCV) exhibits the highest value, being 71% above that expected by chance. In the other countries, SCV values are moderately high, ranging from 11% to 21% beyond that randomly expected (see appendix 1 table 1)

Case-mix of Potentially Avoidable Hospitalisations by country

The relative share of cases per specific condition varies across countries (figure 2), contributing to the differences in rates shown in figure 1. Nevertheless, COPD, CHF and angina seem to cause the bulk of potentially avoidable hospitalisations everywhere.

In Denmark, the most frequent condition is COPD, representing 40% of all PAH, followed by dehydration –well above the other countries-, CHF, angina, asthma and diabetes (19%, 18%, 16%, 6% and 1% respectively)

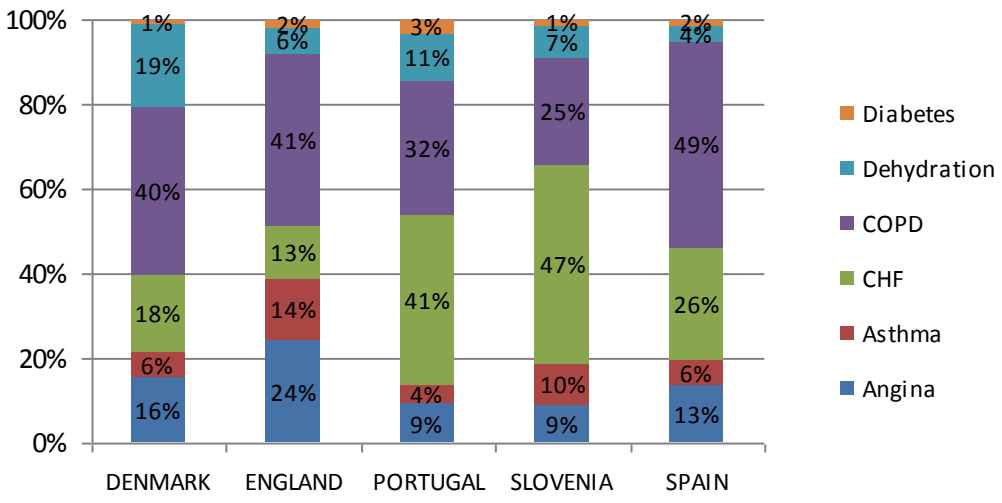

Figure 2. Share of PAH cases by country. Year 2009

** Represents the contribution of each clinical condition in the overall number of avoidable admissions by country.*

Figure 3 compares the relative magnitude of condition-specific rates across countries. Denmark shows high rates in almost all the conditions analysed, having the highest rates in dehydration: 82 admissions per 10,000 inhabitants aged 65 or older in 2009; far from the 8 admissions per 10,000 inhabitants observed in Spain, the country with lowest rate. Danish COPD rate is also the highest: 34 admissions per 10,000 inhabitants aged 40 or older versus 9 admissions in Portugal, the country with the lowest rate. Whereas Portugal and Spain tend to show moderate to low rates (Portuguese rates are also the lowest for urgent angina and asthma admission; Spanish rates for dehydration and diabetes), England has the highest rate of asthma, angina and diabetes admissions, though it also has the lowest CHF admissions rate. Slovenia, with moderate PAH rates in general, shows an outstanding CHF rate (see appendix 1 tables 2-7)

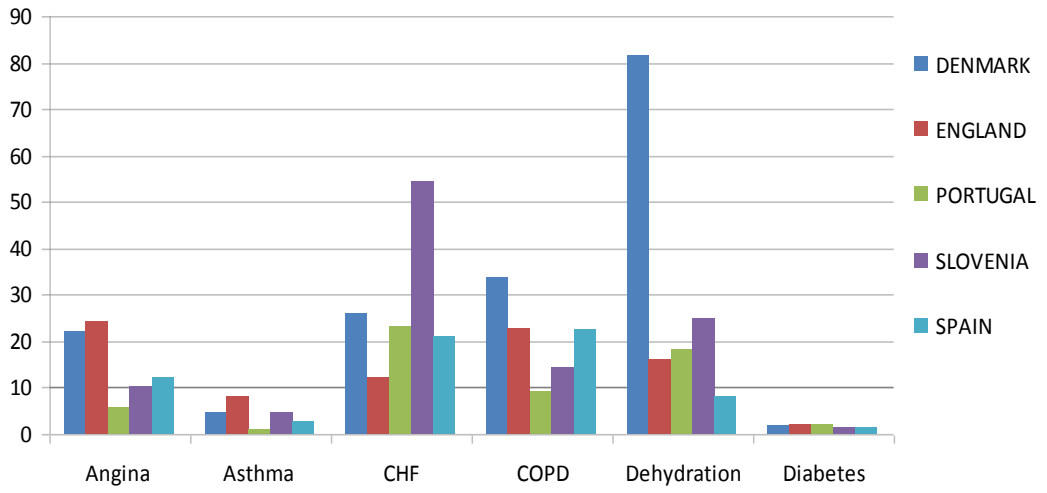

Figure 3. Magnitude of PAH per condition across countries (age-sex standardised rates per 10,000 inhabitants). Year 2009.

III. IN COUNTRY VARIATION

Potentially avoidable hospitalisations are relatively frequent in Denmark, with a remarkable number of cases in COPD and dehydration admissions.

Variation is widespread in all PAH conditions, and a relevant proportion of it is systematic –beyond that randomly expected- for all of them; the least variation across kommuners is for COPD admission rates and the widest in short-term diabetes complications (see appendix 1 tables 8-9).

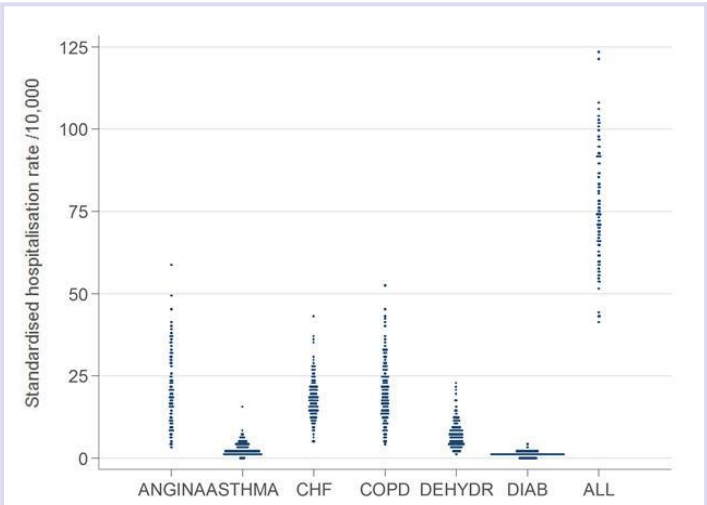

Figure 4. a. Age-sex standardised hospitalisation rates per 10,000 inhabitants (natural scale to compare actual rates). Year 2009

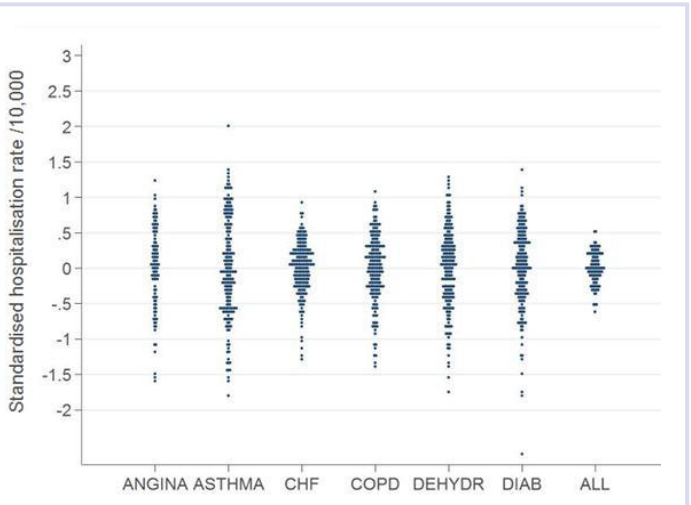

Figure 45.b. Age-sex standardised hospitalisation rates per 10,000 inhabitants (normalised scale to compare degree of variation). Year 2009

** Each dot represents the relevant administrative area in the country (Kommuners for Denmark). The y-axe charts the Kommuner rate per 10,000 inhabitants. On the right, given the plausibly different prevalence of PAH conditions, standardised rates are represented in a common comparable scale. Looking at the former, reader will have sense of the magnitude of the PAH phenomenon, overall and for each condition; looking at the latter, reader will have an image of the actual variation across PAH conditions.*

Overall potentially avoidable hospitalisations (PAH)

The higher the rate or the ratio, the worse the performance.

In 2009, a total of 35,052 admissions were flagged as potentially avoidable with one of the chronic conditions considered in this report. This figure represents around 2.1% of all the admissions in 2009. -1 admission out of 131 adult individuals.

Variation across extreme areas reached 2-fold difference, with a moderate systematic variation – 5% above that expected by chance. Otherwise, the region where the kommuner belongs seems to explain up to 48% of the variation (see appendix 1 table 8, Intraclass Correlation coefficient), which suggest a potential relevant role for regional policy to improve chronic conditions management.

There is a certain geographic pattern of variation: kommuners in the eastern part of the country show comparatively higher rates and their residents bear at least 20% more risk of experiencing potentially avoidable admissions.

Zooming out to the Region level, residents in Sjælland and Hovedstaden have 20% more risk of potentially avoidable admissions than the national average. In turn, population living in Nordjylland, Midtjylland and Syddanmark, have 20% less risk of suffering an avoidable hospitalisation (Figure 8)

Variation in each PAH condition is represented using two geographic units: kommuners and regions. The first set is composed of 98 units and the second comprises 5 regions. While kommuners would represent local provision of chronic care, regions are used as a surrogate for regional policies affecting all the kommuners within each one.

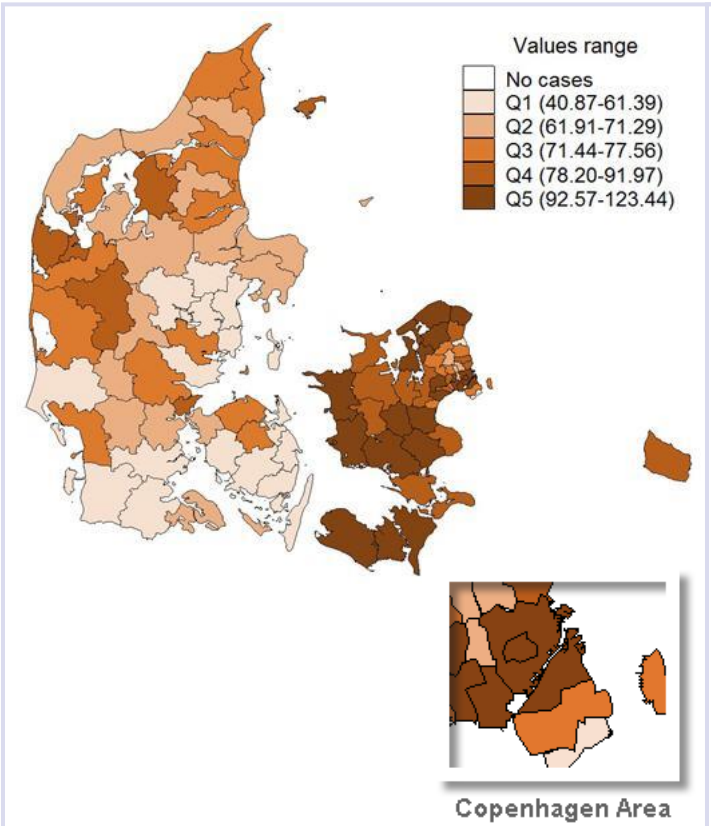

Figure 5. Age-sex standardised all PAH hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

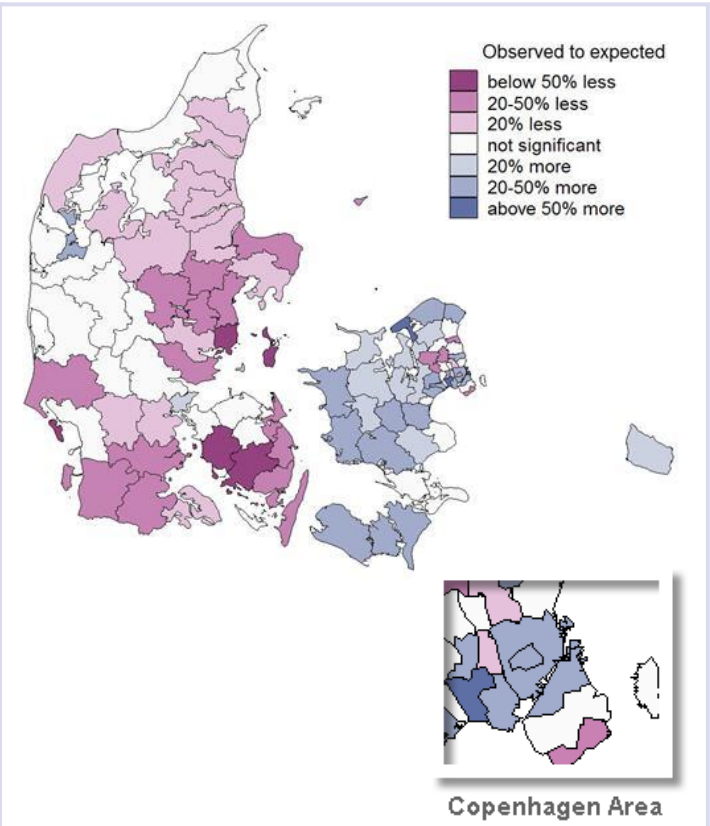

Figure 6. Ratio observed /expected all PAH admissions. 98 kommuners. Year 2009

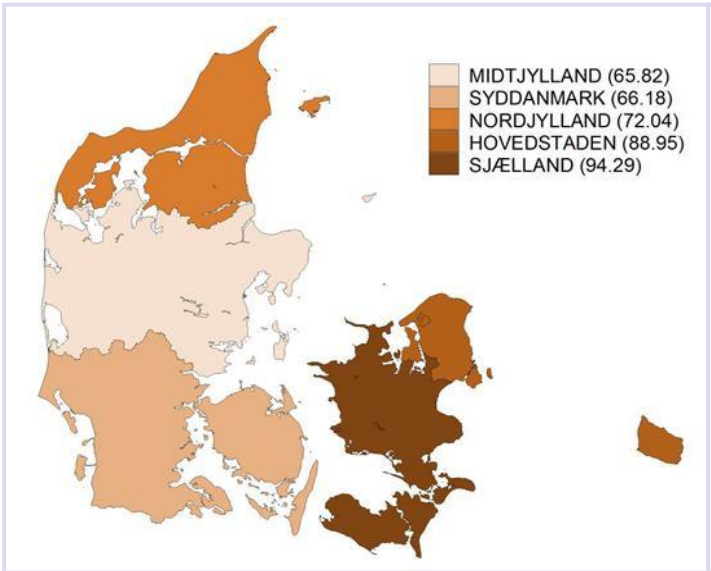

Figure 7 Age-sex standardised all PAH hospitalisation rate per 10,000 inhabitants. 5 regions. Year 2009

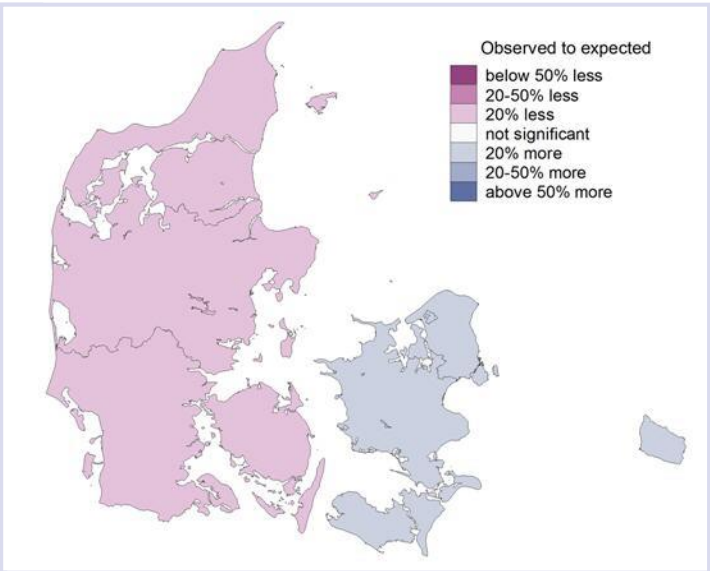

Figure 8. Ratio observed /expected all PAH admissions. 5 regions. Year 2009

** Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Asthma in adults

2,029 discharges with a primary diagnosis of asthma were flagged as potentially avoidable in 2009 – 1 admission per 2,219 adult inhabitants aged 18 or older.

A 4-fold difference in hospitalisations was found between the extreme areas, with moderate systematic variation, 16% above that expected by chance

There is a strong geographical pattern with the east part of the country and some central kommuners showing the highest rates. Accordingly, in assessing relative risk of asthma admissions for the population, those living in the eastern part of the country seem to bear more chances. Most of the areas (72%) have the expected asthma rates according to their population, whilst 9% of the kommuners in Denmark (9 out of 98) showed more than a 50% increased risk of asthma admissions (figures 9 and 10).

Likewise, the map of regions shows that Hovedstaden has a risk of admission 20% higher than the average Conversely, Nordjylland and Midtjylland show remarkable low ratios (figure 12).

Although some regions show statistically significant high rates of admissions for this condition, the effect is almost negligible, since only 1% of the variation is statistically amenable to the region (see appendix 1 table 8, Intra-class Correlation Coefficient).

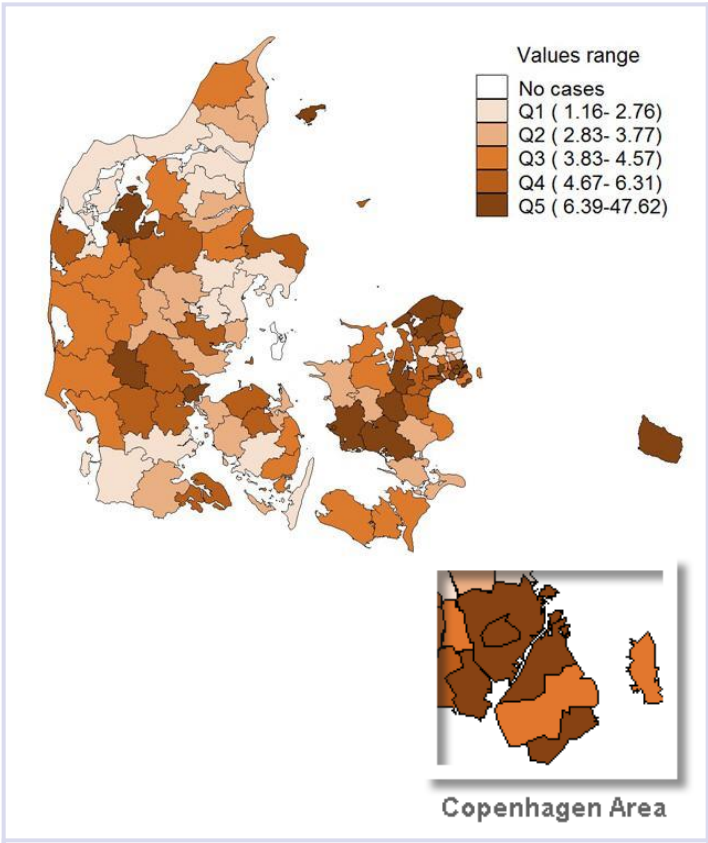

Figure 9. Age-sex standardised asthma hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

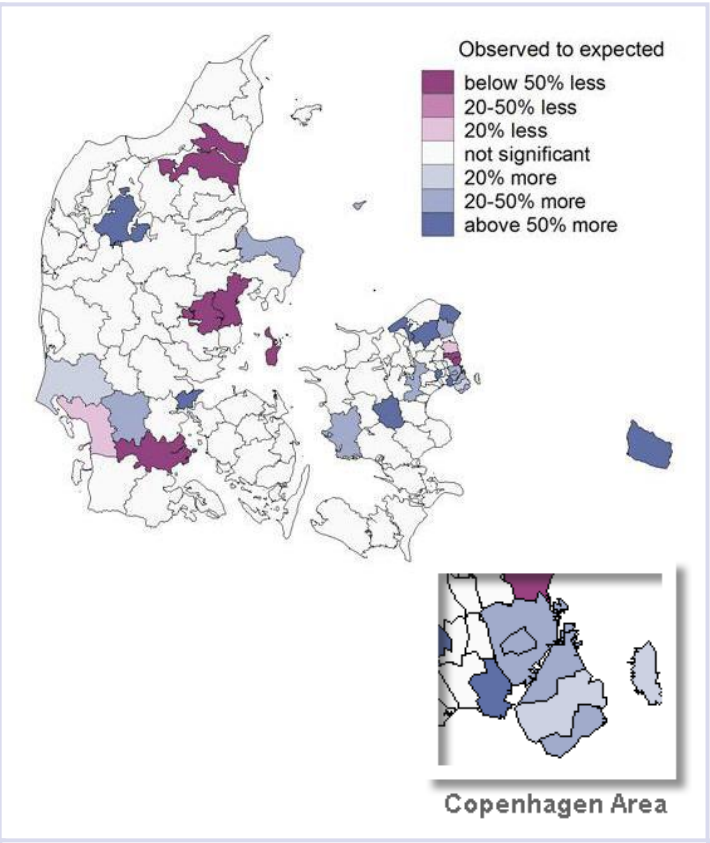

Figure 10. Ratio observed/expected asthma admissions 98 kommuners. Year 2009

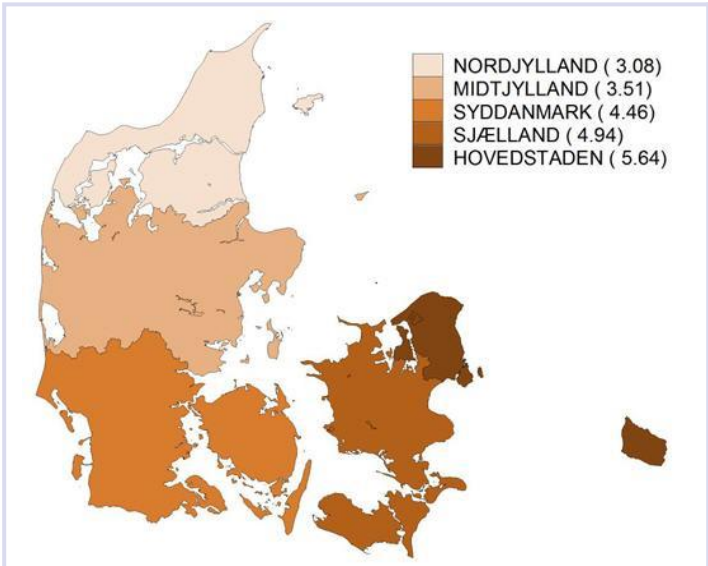

Figure 11 Age-sex standardised asthma hospitalisation rate per 10,000 inhabitants. 5 regions. Year 2009

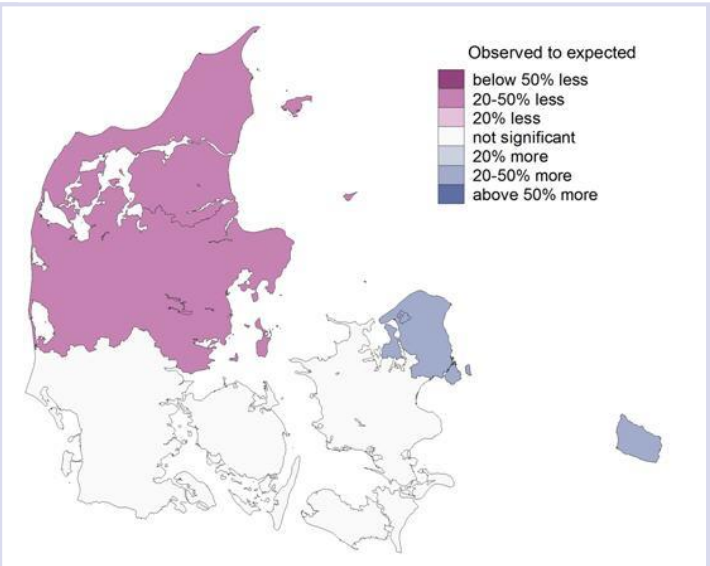

Figure 12. . Ratio observed/expected asthma admissions. 5 regions. Year 2009

** Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Congestive Heart Failure relapse admissions (CHF)

6,420 discharges with the diagnosis of Congestive Heart Failure (CHF) were signalled as potentially avoidable in 2009 –1 unplanned admission per 445 adults aged 40 or older.

A 4.3-fold difference was found between kommuners with extreme high and low rates, and the systematic variation was some moderate 12% above that expected by chance (SCV=0.12, see appendix 1 table 9).

In 2009, 30% of the kommuners –most of them in the central part of the country- showed a risk of admission more than 20% smaller than the average. In turn, people living in the east part of the country endured high relative risk of CHF admissions, particularly in Copenhagen area (bluish areas in figure 14).

The observed patterns were highly correlated with the region of residence. Nordjylland and Midtjylland showed lower risk than expected. On the contrary Sjælland and Hovedstaden showed more than a 20% risk above average of being hospitalized with CHF.

Actually, variation in CHF admissions is highly explained by the regions – up to 62% of the variation across kommuners would be explained by some contextual phenomenon (e.g. regional policy) homogeneously affecting the whole region (see appendix 1 table 8, Intraclass Correlation coefficient).

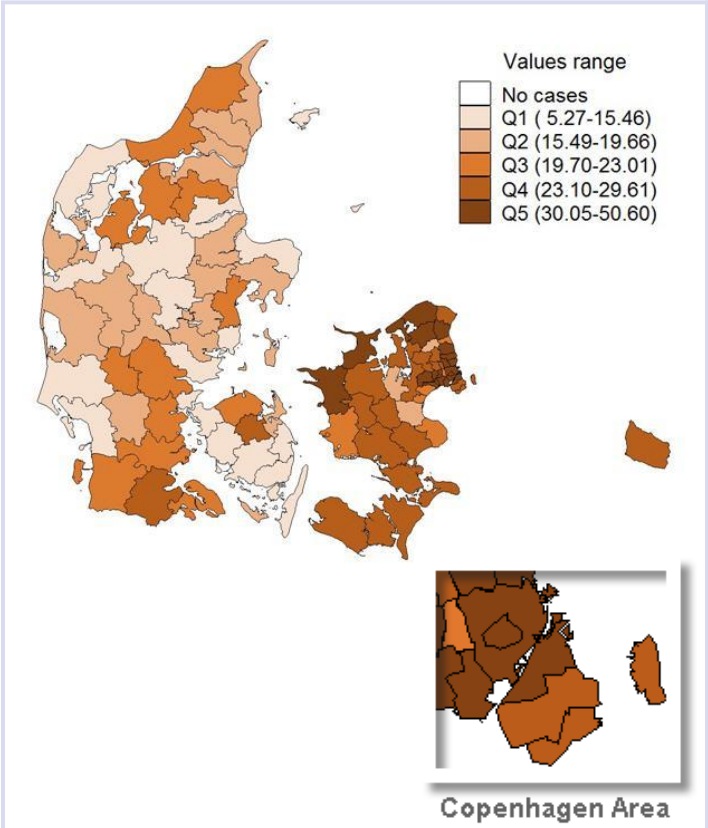

Figure 13. Age-sex standardised CHF hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

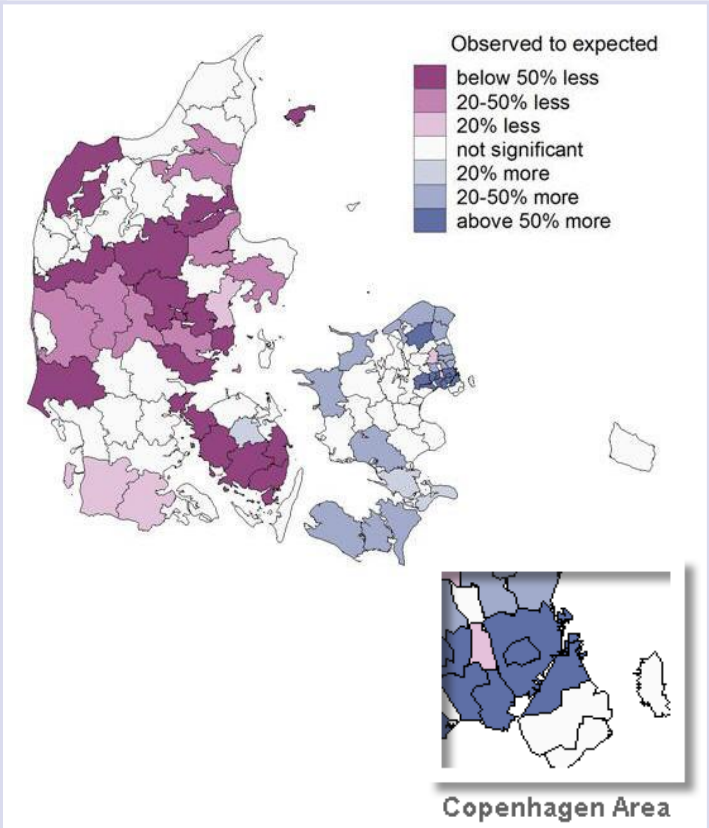

Figure 14. Ratio observed/expected CHF admissions. 98 kommuners. Year 2009

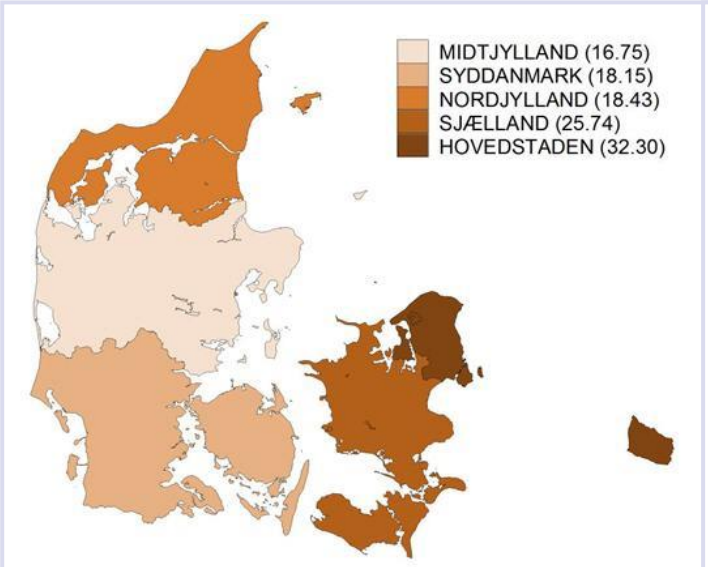

Figure 15 Age-sex standardised CHF hospitalisation rate per 10,000 inhabitants. 5 regions. Year 2009

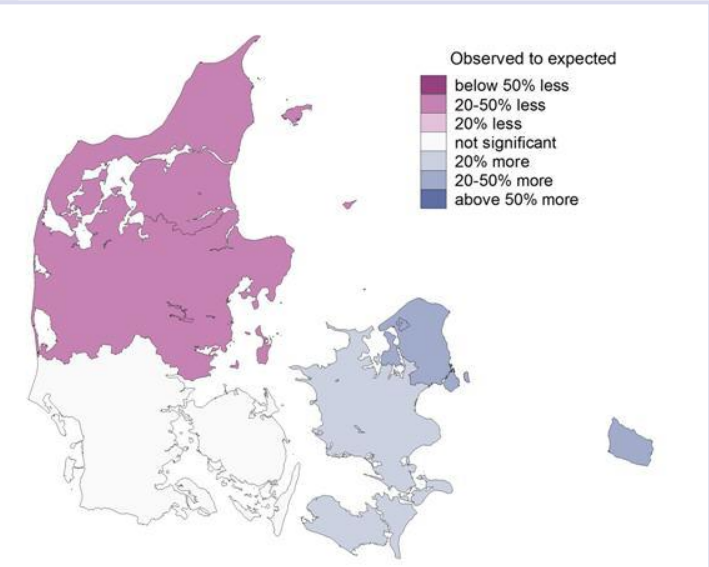

Figure 16. Ratio observed/expected CHF admissions. 5 regions. Year 2009

** Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Chronic Obstructive Pulmonary Disease relapse admissions (COPD)

By far, COPD is the most prevalent PAH condition. In 2009, 14,206 COPD admissions were flagged as potentially avoidable –40% of all the admissions considered as such.

The difference between areas with extreme rates (EQ 5-95) reached a 2.5-fold factor, while the systematic variation was the lowest observed among PAH conditions, just a 5% above that randomly expected (SCV=0.05); this points out quite an overall similar behaviour across kommuners.

Nevertheless, some territorial pattern can be detected: Higher COPD admission rates can be found in the east and in some western kommuners, correlating with significant higher risk of admissions for residents in those areas (figures 17 and 18).

Regions barely explain 7% of the observed variation, but the highest risk of admission (between 20 and 50% higher than average) is found in Sjælland (figure 20).

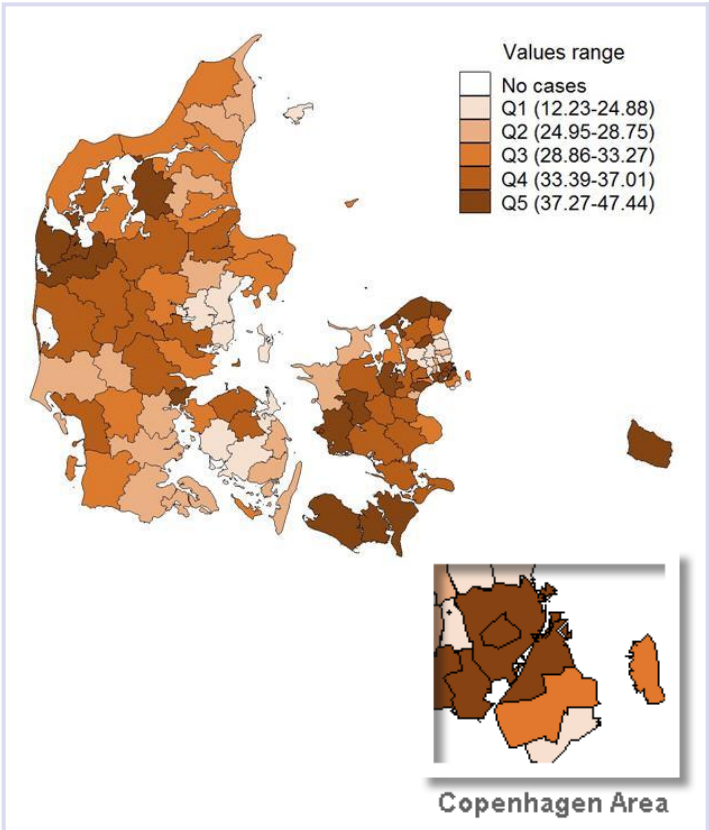

Figure 20. Age-sex standardised COPD hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

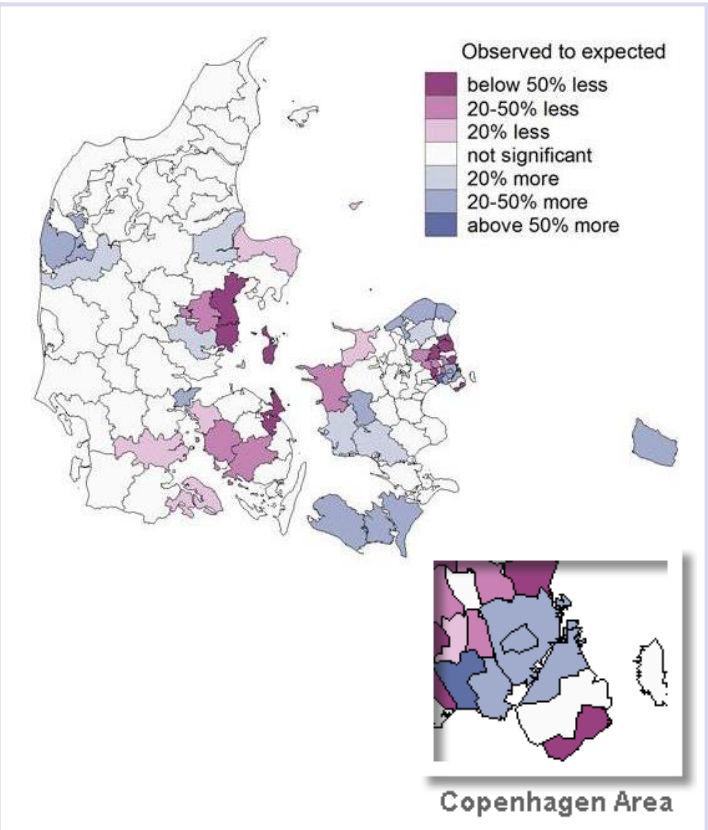

Figure 21. Ratio observed/expected COPD admissions. 98 kommuners. Year 2009

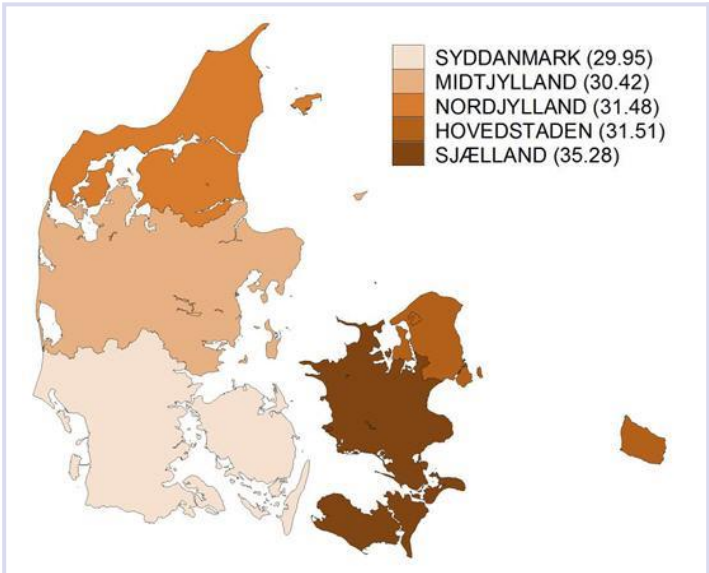

Figure 22 Age-sex standardised COPD hospitalisation rate per 10,000 inhabitants COPD. 5 regions. Year 2009

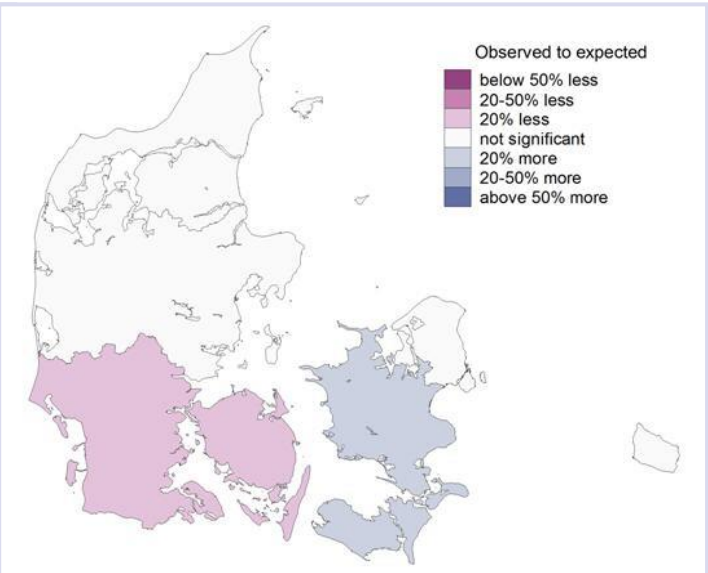

Figure 23. Ratio observed/expected COPD admissions. 5 regions. Year 2009

** Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Dehydration admissions

6,906 dehydration admissions were flagged as potentially avoidable in 2009 –1 admission in 133 inhabitants aged 65 or older. This is a large figure far from that detected in the other ECHO countries.

A 3.4-fold difference was found between the extreme areas, with a moderate systematic variation, 11% over that expected by chance. The regional level seems to explain up to 50% of the variation (see appendix 1 table 8, Intraclass Correlation coefficient), which suggest a relevant role of regional policy and/or services organisation managing this condition.

As observed in figure 24, high dehydration rates are observed in eastern and northern kommuners. The risk of admission in some of those areas remains significantly higher than expected (bluish areas in figure 22). In turn, in most of the central-western kommuners, such risk is below 50% less than the average.

At regional level, residents in Midtjylland see their risk of admission for this condition decreased by more than 50% when compared to the average; meanwhile Hovedstaden population showed an increase in their risk above 20% (figure 24).

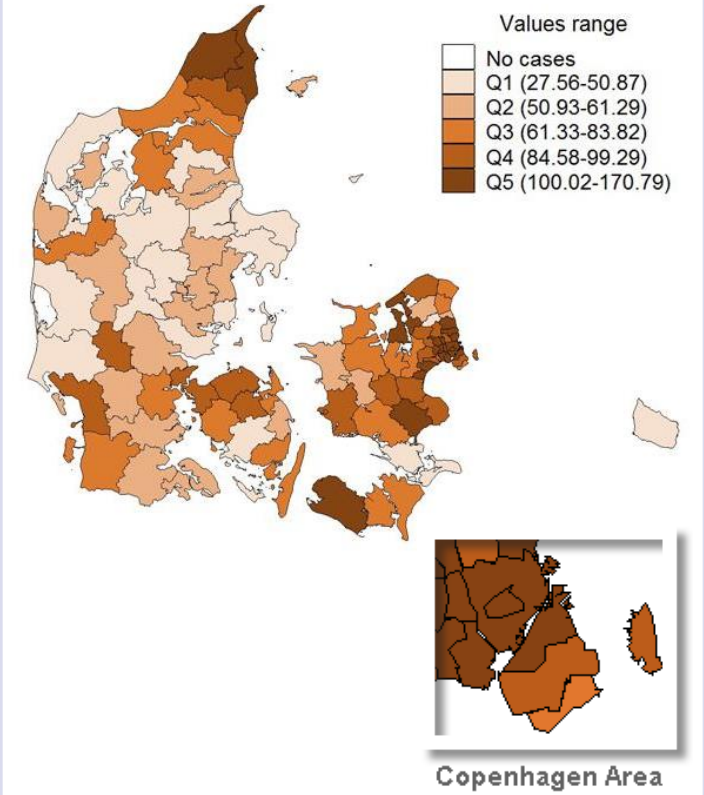

Figure 21. Age-sex standardised Dehydration hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

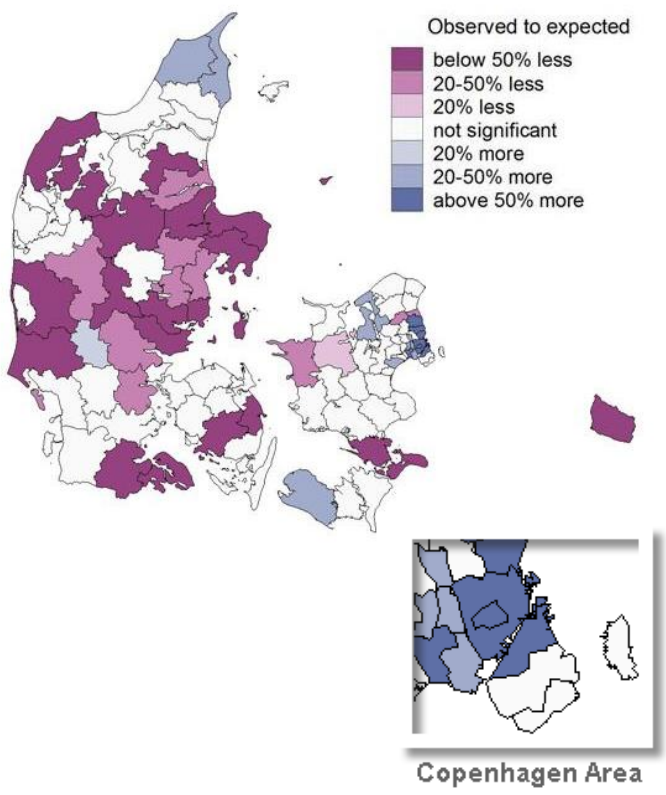

Figure 22. Ratio observed/expected dehydration admissions. 98 kommuners. Year 2009

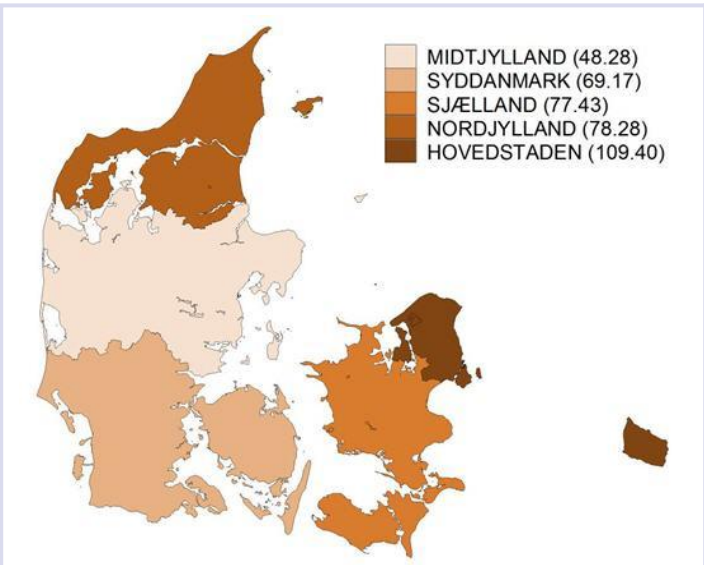

Figure 23. Age-sex standardised Dehydration hospitalisation rate per 10,000 inhabitants. 5 regions

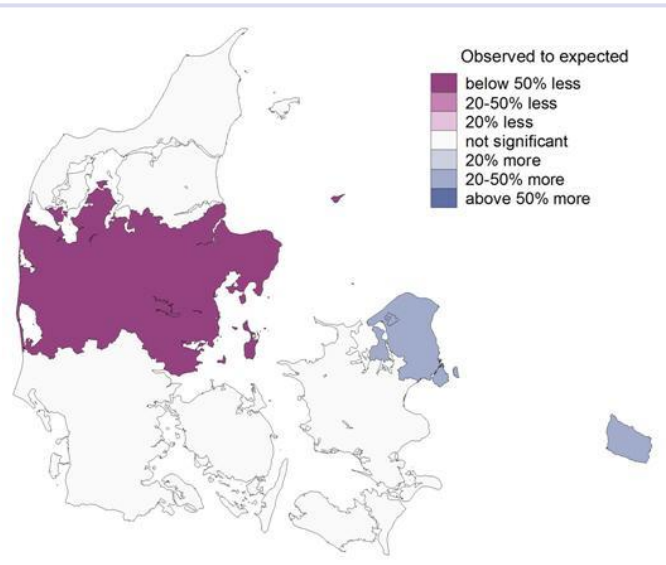

Figure 24. . Ratio observed/expected dehydration admissions. 5 regions. Year 2009

* ** Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Diabetes admissions caused by a short-term complication

Admissions due to diabetes short-term complications are the least frequent PAH condition. In 2009, 406 admissions with a diagnosis of short-term complication of diabetes were signalled as potentially avoidable – around 1 per 6,289 adult inhabitants aged 40 or older.

Variation between kommuners with extreme rates was the largest among PAH conditions – almost 8-fold difference. Systematic variation was also substantial – 24% above that expected by chance. In this case, just 11% of the variation in diabetes admissions could be attributed to regional policies, suggesting a more critical role of medical practice at kommuner level in this condition.

Those kommuners showing the highest rates (dark brown figure 25) seem to be also those with the poorest performance, with their population bearing more than 50% increased risk of admission from this type of complications compared to the average (deep blue in figure 26).

Unlike the other conditions, Nordjylland and Midtjylland populations seem to have the highest risk of diabetes complications admission, at least 20% higher than expected. In turn, residents in Hovedstaden experience a risk 20% lower than expected (figure 28).

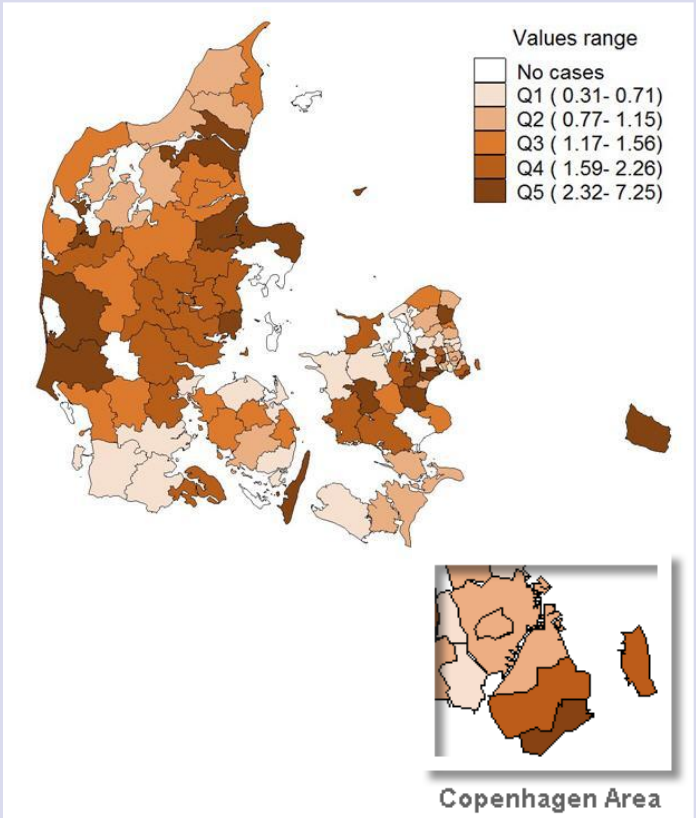

Figure 25. . Age-sex standardised Diabetes hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

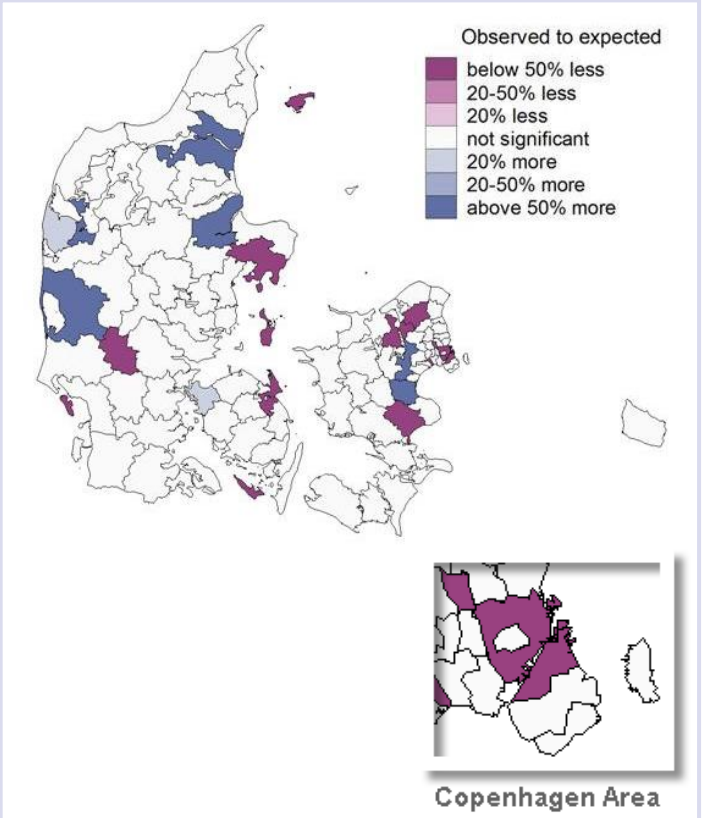

Figure 26. Ratio Observed/expected diabetes admissions. 98 kommuners. Year 2009

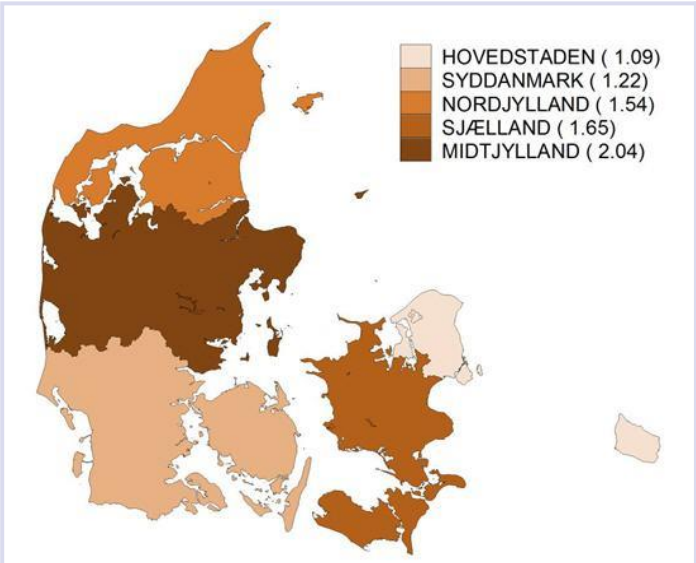

Figure 27. . Age-sex standardised Diabetes hospitalisation rate per 10,000 inhabitants. 5 regions. Year 2009

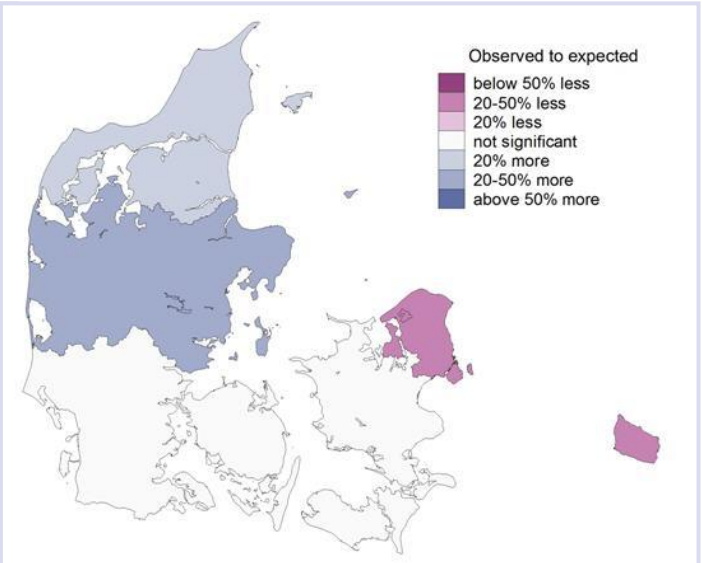

Figure 28. . Ratio observed/expected diabetes admissions. 5 regions. Year 2009

** * Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

Angina- with no concurrent procedure admissions

5,507 emergency angina admissions were flagged as potentially avoidable in 2009 –1 admission per 490 inhabitants aged 40 or older.

An extreme ratio of almost 7 was found across kommuners. Systematic variation was the highest among PAH conditions: 30% over that expected by chance. The regional level explains up to 56% of this variation, suggesting the region influence in managing angina (see appendix 1 table 8 Intraclass Correlation coefficient).

Figure 29 shows quite a defined geographic pattern with the east part of the country and some western and central kommuners showing the highest rates. In most of these areas such rates translated into increased risk of admission from this condition for residents (bluish areas in figure 30).

When the analysis is performed by region, in Sjælland the risk of undergoing an urgent admission due to angina is more than 50 % higher than the average. In turn, population living in Syddanmark shows more than 50% less risk and 20% less in Midtjylland, despite some specific kommuners showing high rates of angina admissions (figure 30 and 32).

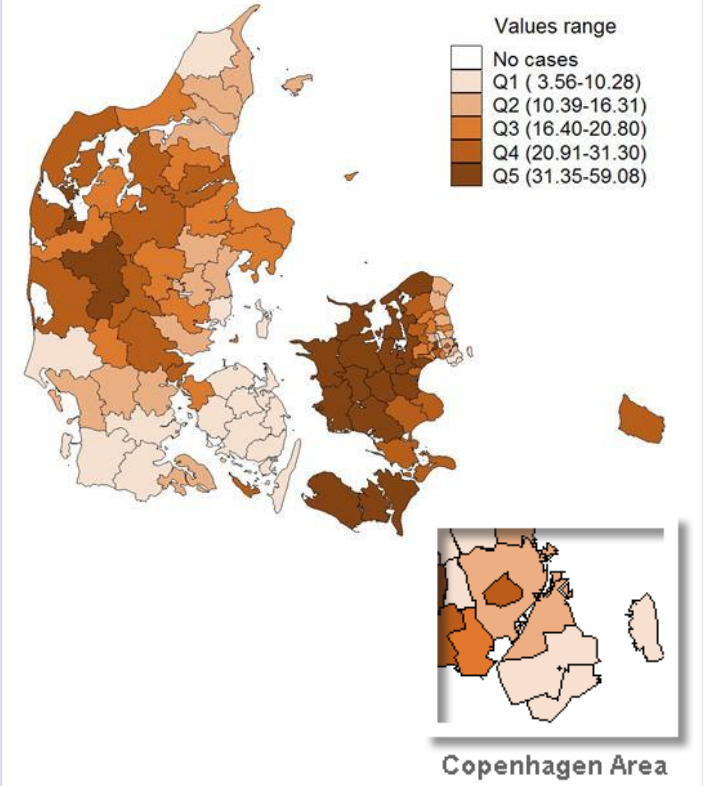

Figure 29. Age-sex standardised Angina hospitalisation rate per 10,000 inhabitants. 98 kommuners. Year 2009

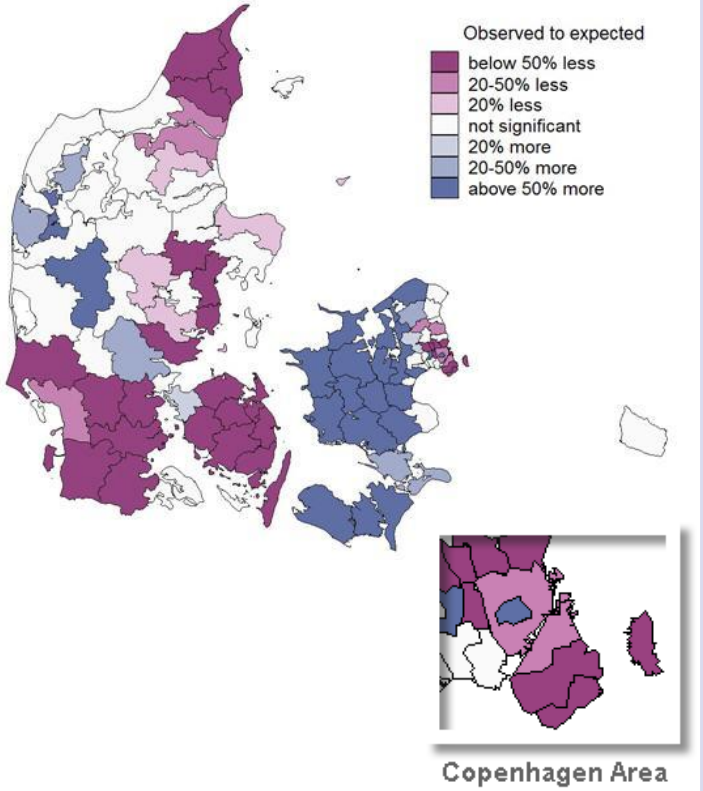

Figure 30. Ratio observed/expected angina admissions. 98 kommuners. Year 2009

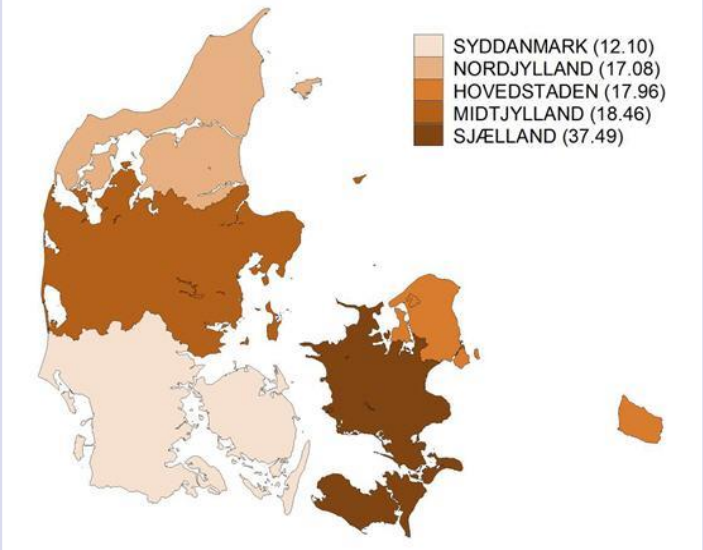

Figure 31. Age-sex standardised Angina hospitalisation rate per 10,000 inhabitants. 5 regions. Year 2009

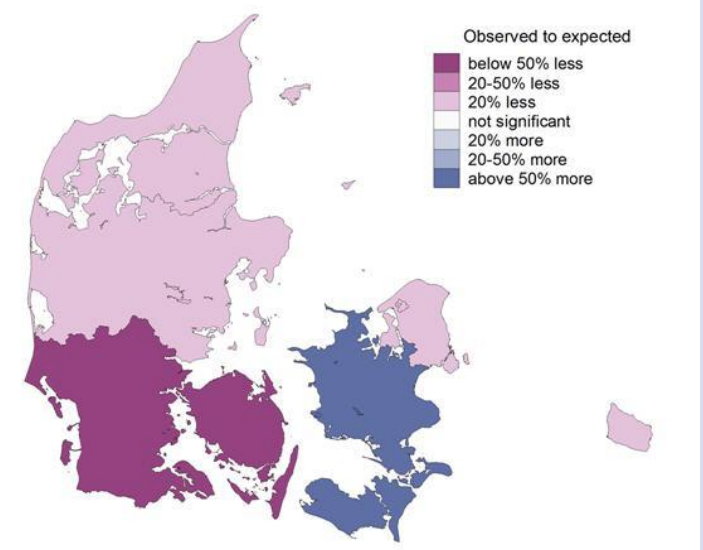

Figure 32. . Ratio observed/expected angina admissions. 5 regions. Year 2009

** * Maps on the left (standardised rates) merely represent the amount of admissions flagged as a potentially avoidable hospitalisation -the darker the colour, the more the number of admission per 10,000 inhabitants. Areas are clustered into 5 quintiles according to their rate value (Q1 to Q5). –legend within the maps provides the range of standardised rates within each quintile. Maps on the right reflect the level of performance in each area using as a proxy the ratio observed to expected number of PAH. Population living in areas with values above 1 (bluish) will be overexposed to PAH (poor performance); population in areas with ratio below 1 (pink) will be underexposed to PAH (good performance).*

The aggregated rate of avoidable hospitalisation has slightly decreased in the period 2002 to 2009, while systematic variation has remained stable over time.

IV. EVOLUTION OVER TIME

Between 2002 and 2009, rates of potentially avoidable hospitalisations decreased by 16%, from 97 to 82 admissions per 10,000 inhabitants – from 1 admission per 105 to 1 admission per 127 adult inhabitants. However, systematic variation remained stable over this period (see appendix 1 table 10)

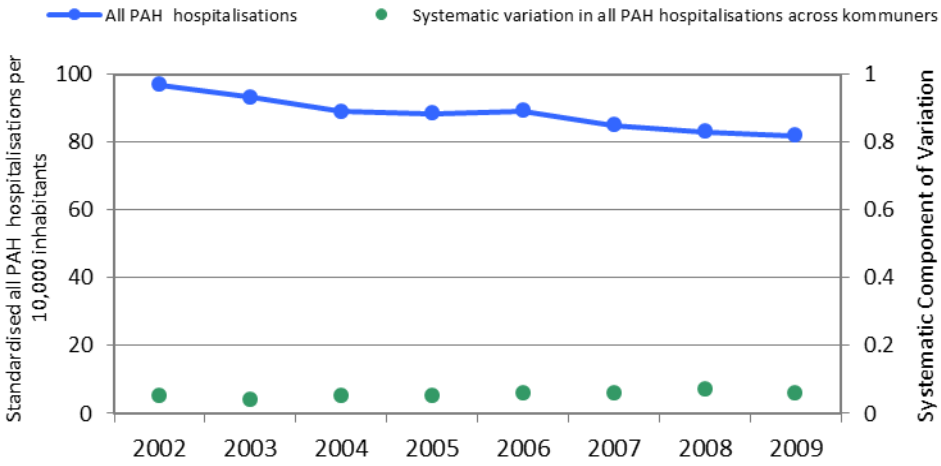

Figure 33. Evolution of standardised rates (blue lines) and systematic variation (green dots) over time

We should look first at the evolution of the PAH rate– an increasing trend would be a bad result regardless the evolution of the variation. The best result will be a decline both in the rate and the variation. A decrease in the rate concurrent with a larger variation should lead us to further analysis on the specific drivers in those areas departing from the general trend.

All PAH, except dehydration and diabetes admissions, showed a decreasing trend, with urgent angina admissions offering the highest decrease (a 44% decrease). Dehydration, on the other hand, showed a high increase of 74%, from 1 admission per 197 in 2002 to 1 admission per 113 inhabitants aged 65 or older in 2009. These rates are far from those observed in other ECHO countries. Diabetes short-term complications rate also increased by 29% over the period (see appendix 1 tables 11-16).

With regard to systematic variation, COPD was the only condition experiencing a decline- up to a 50% of relative reduction since 2002. Diabetes and angina were the conditions experiencing the highest increase in systematic variation – up to 4 times the figures in 2002.

Figure 34 . Evolution of standardised rates (blue lines) and systematic variation (green dots) over time

Trends in those areas within the lowest and highest quintiles of admission rates in 2002 - overall potentially avoidable hospitalisations

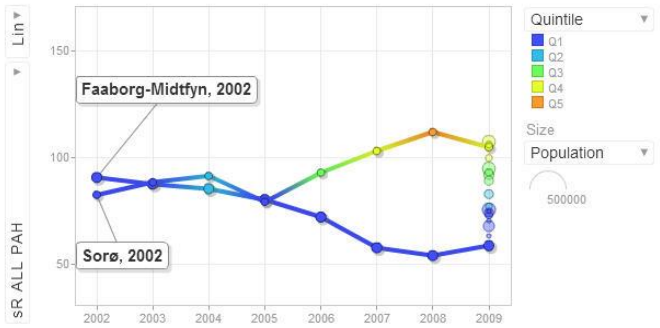

Figure 35 . Individual evolution over time in all PAH rates. Areas with the lowest levels (Q1) in 2002

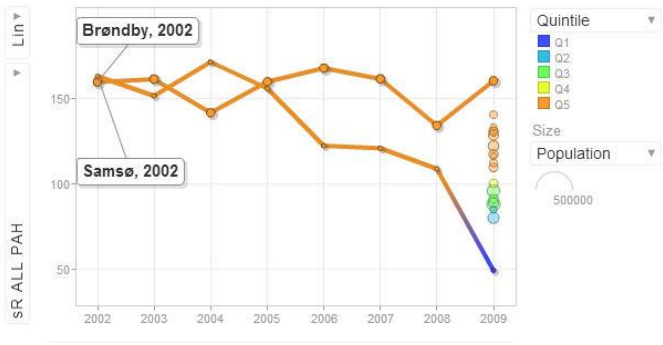

Figure 36 . Individual evolution over time in all PAH rates. Areas with the highest levels (Q5) in 2002

** Bubbles represent the kommuners. The bigger the bubble, the larger the population living in the area. Dark-blue corresponds tothe lowest rates of PAH in the country (1st quintile Q1) , while orange represenst the highest rates of PAH (5th quintile Q5). Bubbles (kommuners) will remain in the same colour or shift to another depending on where their admission rates seat each year. Colour change allows for the tracking of changes in the behaviour of individual kommuners over the period of analysis*

Taking as an example Sorø and Faaborg-Midtfyn, both areas showed a relatively good performance (among the lowest levels of PAH) in 2002. The evolution of these two areas was extremely uneven. While Sorø has even further reduced its rates of PAH, Faaborg-Midtfyn has experienced a steady increase, reaching to the highest levels in the country by the end of the period (figure 35).

It can be observed that areas with highest levels of PAH in 2002 (Q5 in orange) also experienced uneven evolution over the period. Thus, while Brondby remained in the same quintile over time, the PAH rate in Samsø (with similar size) decreased over time until the lowest quintile of exposure (figure 36)

In the following figures (figures 37-48), similar patterns can be observed in each of the specific chronic conditions studied in this Atlas report

See more: You can track the evolution of individual kommuners at:

http://www.echo-health.eu/handbook/quintiles_pah_dnk.html

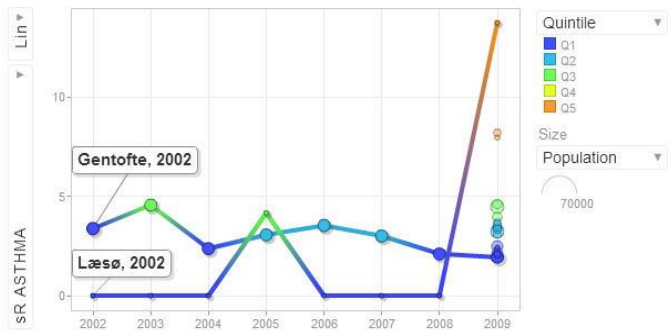

Figure 37. Trends in asthma rates in areas with lowest levels (Q1) in 2002.

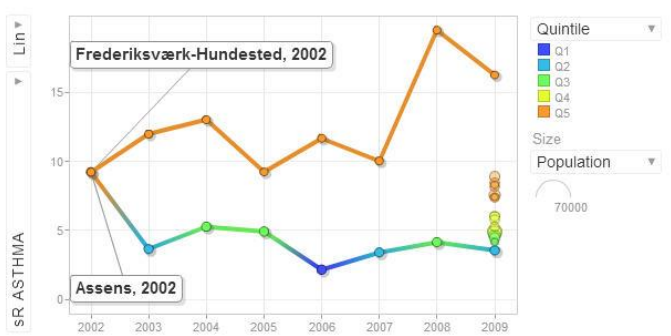

Figure 38. Trends in asthma rates in areas with highest levels (Q5) in 2002

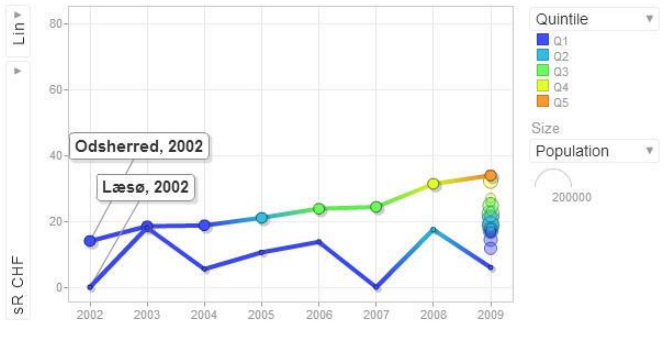

Figure 39 . Trends in CHF rates in areas with lowest levels (Q1) in 2002.

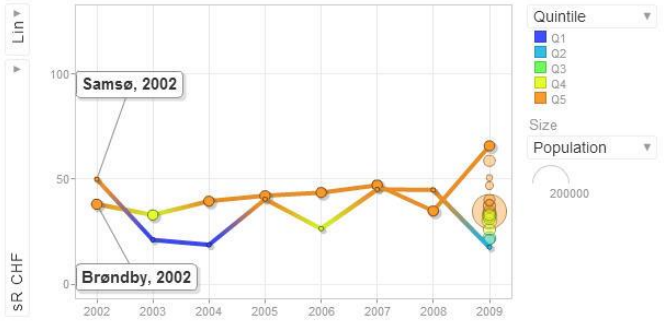

Figure 40. Trends in CHF rates in areas with highest levels (Q5) in 2002

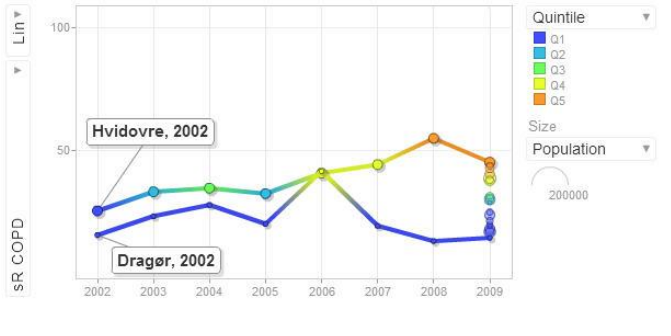

Figure 41. Trends in COPD rates in areas with lowest levels (Q1) in 2002.

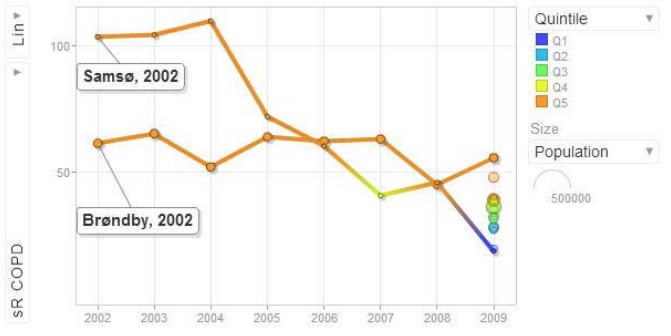

Figure 42. Trends in COPD rates in areas with highest levels (Q5) in 2002

** Bubbles represent the kommuners. The bigger the bubble, the larger the population living in the area. Dark-blue corresponds to the lowest rates of PAH in the country (1st quintile Q), while orange represents the highest rates of PAH (5th quintile Q5). Bubbles (kommuners) will remain in the same colour or shift to another depending on where their admission rates seat each year. Colour change allows for the tracking of changes in the behaviour of individual kommuners over the period of analysis.*

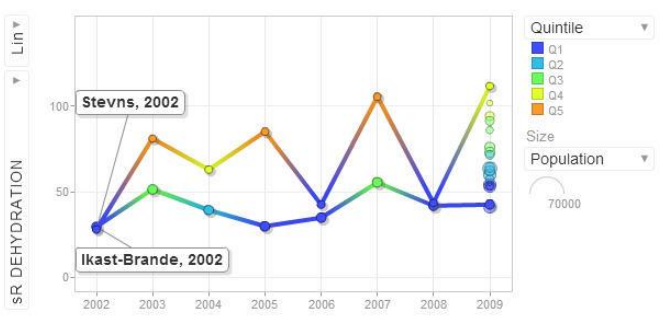

Figure 43. Trends in dehydration rates in areas with lowest levels (Q1) in 2002.

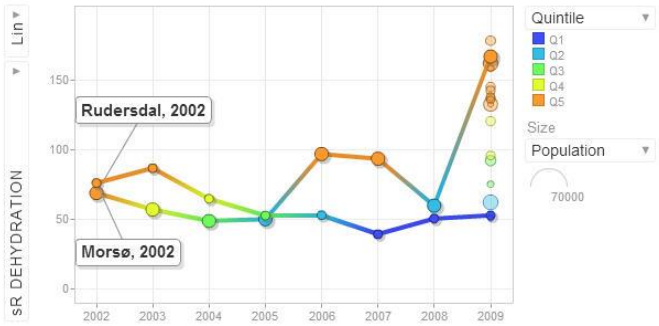

Figure 44. Trends in dehydration rates in areas with highest levels (Q5) in 2002

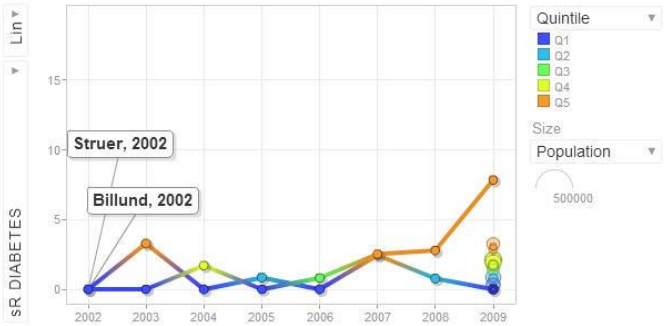

Figure 45. Trends in diabetes rates in areas with lowest levels (Q1) in 2002.

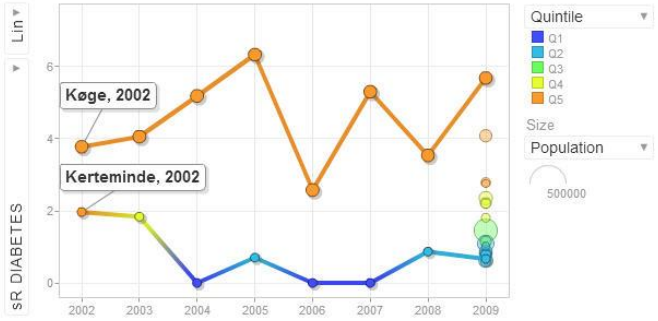

Figure 46. Trends in diabetes rates in areas with highest levels (Q5) in 2002

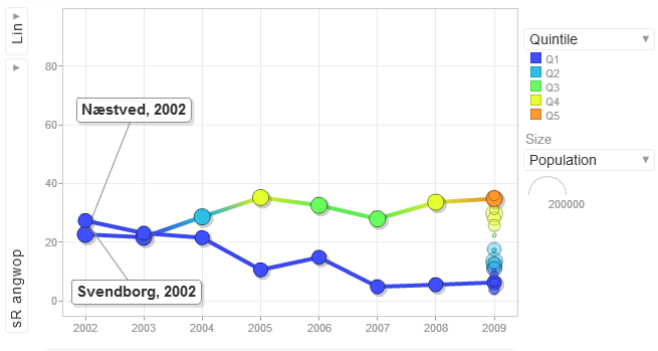

Figure 47. Trends in angina rates in areas with lowest levels (Q1) in 2002.

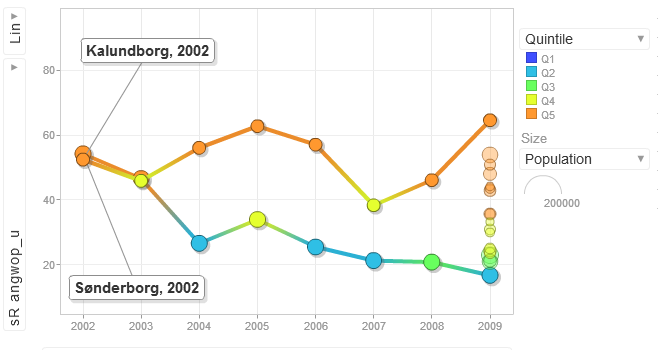

Figure 48. Trends in angina rates in areas with highest levels (Q5) in 2002

** Bubbles represent the kommuners. The bigger the bubble, the larger the population living in the area. Dark-blue corresponds to the lowest rates of PAH in the country (1st quintile Q), while orange represents the highest rates of PAH (5th quintile Q5). Bubbles (kommuners) will remain in the same colour or shift to another depending on where their admission rates seat each year. Colour change allows for the tracking of changes in the behaviour of individual kommuners over the period of analysis.*

In Denmark, there are no significant differences in potentially avoidable hospitalizations across wealth levels

V. SOCIAL GRADIENT

When examining the overall rates of potentially avoidable hospitalisations, no differences were detected between wealthier and most deprived areas. Thus, the differences across kommuners described in the previous sections do not seem to stem from their uneven level of wealth.

Graphs in this section aim at providing some sense of the behavior of potentially avoidable hospitalizations depending on the average level of affluence in the kommuner. At a glance it will show whether there are differences between the better-off and the worse-off areas, and if such differences vary over time.

Overall potentially avoidable hospitalisations

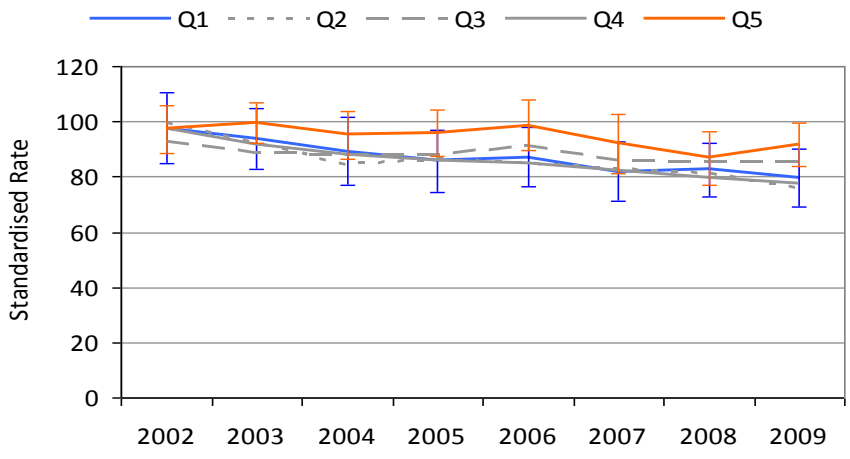

Figure 49. Trend in PAH standardised rates by average income quintile

** Areas are divided in 5 categories of wealth (average annual family income available per individual): from Q1 (blue) corresponding to the worse-off areas, to Q5 (orange) corresponding to the better off areas. Each line in the graph corresponds to the evolution of PAH rates in a wealth level (evolution in Q1 in blue and in Q5 in orange). Statistical differences across income quintiles will occur just when the confidence intervals (whiskers) for different quintiles do not overlap.*

The same conclusion can be reached for any of the specific conditions analysed above: kommuners in the extremes of the range of average income do not differ in their populations' exposure to avoidable hospitalisations. Only hospitalisations from dehydration in the elderly showed a small, though statistically significant,

gap by the end of the period of analysis, indicating that populations living in the most affluent kommuners were more exposed to this type of avoidable admissions than those in the lower end.

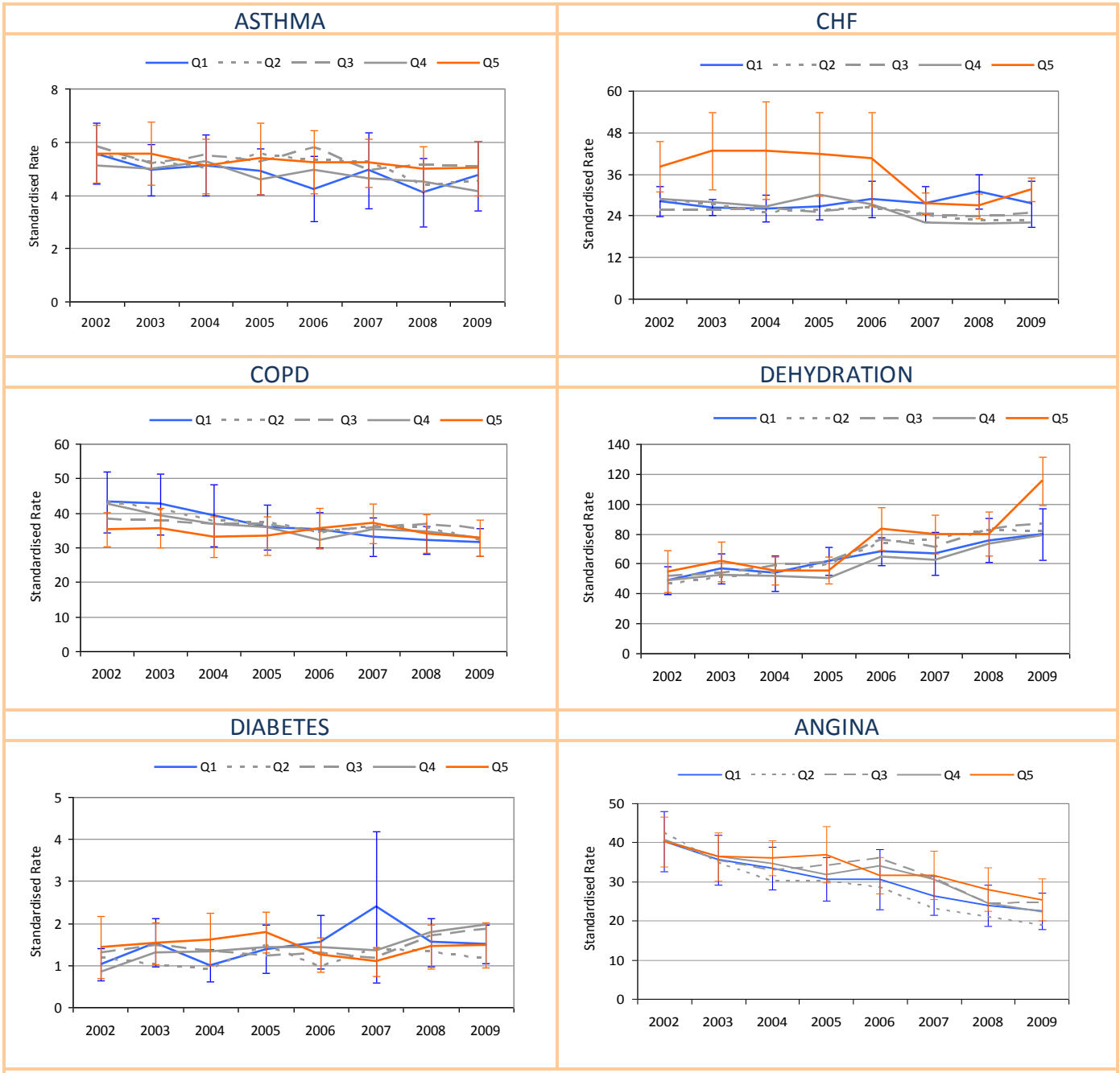

Figure 50. Trend in PAH standardised rates by income quintile and clinical condition

VI. POLICY IMPLICATIONS

In Denmark, potentially avoidable hospitalisations rates have decreased along the period 2002-2009. Despite this decreasing trend, Denmark shows the highest rates in PAH compared to other ECHO countries. In addition, variation not amenable to random phenomena is low across kommuners.

These high PAH rates would warrant further investigation of the underlying causes. In the literature, different factors have been suggested to explain differences in PAH:

- Barriers in access to primary care and/or failures in the quality of the services provided by physicians and staff nurses in primary care settings
- Lack of continuity of care between primary and specialized care.
- Distance to a hospital and/or differences in supply of hospital care. High concentration of hospital care very often leads to more intense hospital utilisation (i.e. more patients are referred from ambulatory consultation in case of relapse). Besides, some countries have developed special hospital units dedicated to deal with chronic patients' relapses
- Different discharging policies. For instance, premature discharges from acute episodes could increase the overall number of admissions on the basis of a rise in the number of readmissions.
- Socio-economic differences. Socioeconomic conditions have been described to have a major impact on prevalence and severity of chronic conditions and patient's ability to self-care and to seek healthcare or navigate available resources.
- Supply of long-term and home-care. When community and home care are insufficient, reliance on hospital care becomes more critical to assure control of chronic patients.

In Denmark, General Practitioners (GP) play a key role as the first point of contact for patients and as the gatekeepers to specialised care. There is an even distribution of doctors across the country with reasonable equity in physical access to GP services[1]. This is coherent with our finding of no differences in PAH admissions across kommuners with different economic levels. Although, some regions have recently been reported to have difficulties in replacing retiring GPs, particularly in rural areas.

Otherwise, the number of outpatient contacts (including specialised care) is among the lowest in Europe, which could eventually contribute to higher PAH rates in Denmark.

However, it is worth noting, that the number of outpatient contacts has been steadily increasing since the 90's. Specifically, more than 7 contacts with the GP per Danish inhabitant in 2009 against six contacts in 2000 (National Board of Health, 2010c).

The supply of long-term and home-care may also play a role in reducing the number of avoidable hospitalisations. It would be worth exploring this effect in the areas with the highest and lowest rates. If those areas were differently endowed in this type of services, their role might be confirmed. Good practices of reference could be then identified.

Since 2007, after a major structural reform of the administrative system, the main responsibility to provide health care services resided with the regions, but the municipalities assumed full responsibility for prevention, health promotion and rehabilitation outside of hospitals. Therefore both the Region and kommuner of residence are relevant as health policy drivers -region explaining up to 48% of the observed variation in PAH across kommuners. It would be advisable to take some time in understanding possible mechanisms to improve management of chronic conditions promoted by each administrative tier as well as their coordination.

In this line of thought, the National Board of Health launched a national strategy on chronic disease management and developed a generic model for chronic disease management programmes together with the regions and the kommuners (2011). This model describes prerequisites for integrated care, principles for self-monitoring and treatment by the patients and patient education. Most importantly, the generic model serves as a template for the joint development of

[1] All background information on Danish Health System can be consulted at European Observatory of Health Systems and policy platform: Health Systems Policy Monitor http://www.hspm.org/countries/denmark27012013/countrypage.aspx

disease-specific management programmes by the regions and kommuners. These disease management programmes include some PAH conditions, such as diabetes or COPD.

Potentially avoidable hospitalisations rates have decreased In Denmark along the period 2002-2009. Despite this trend, Denmark still shows the highest PAH rates among ECHO countries. Levels of wealth at kommuner level seem to be unrelated to the level of exposure to PAH, however, the regional level plays a relevant role in explaining it.

Understanding possible mechanisms to improve management of chronic conditions promoted by each administrative tier, as well as their coordination, could be key in reducing PAH. Recent efforts to implement models for chronic disease management aimed to enhance continuity of care and coordination across different types of services may have a positive impact. The type of analysis described in this report would be helpful in assessing the extent and distribution of such effect.

APPENDIX 1:

Tables International Comparison 2009

Table 1

	ALL PAH				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	35,052	228,527	24,252	7,303	155,776
Stand. Rate	81.44	55,65	30.90	60.95	46.19
EQ5-95	1.87	2.34	2.64	2.25	3.22
SCV	0.71	0.15	0.21	0.15	0.11

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

Table 2

	ASTHMA				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	2,029	32,406	932	703	9,552
Stand. Rate	4.63	7.96	1.05	4.71	2.84
EQ5-95	2.89	2.18	6.97	4.01	6.18
SCV	0.13	0.77	0.69	0.07	0.37

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

Table 3

	CHF				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	6,420	29,080	9,862	3,442	41,056
Stand. Rate	25.83	12.36	23.03	54.14	20.93
EQ5-95	2.21	1.85	2.21	3.34	2.58
SCV	0.77	0.1	0.65	6.56	0.29

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

Table 4

	COPD				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	14,206	93,597	7,709	1,853	76,362
Stand. Rate	33.7	22.69	9.09	14.2	22.25
EQ5-95	1.98	2.37	4.16	2	3.53
SCV	0.58	0.22	0.39	0.13	0.27

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

APPENDIX 1:

Tables International Comparison 2009

Table 5

	DEHYDRATION				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	6,906	12,981	2,674	548	5,672
Stand. Rate	81.65	16.11	18.19	24.7	8.13
EQ5-95	2.94	2.26	4.5	6.83	4.24
SCV	26.3	0.1	1.04	1.42	0.29

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

Table 6

	DIABETES				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	406	4,667	772	100	2,420
Stand. Rate	1.74	2.02	2.01	1.51	1.32
EQ5-95	3.58	2.6	12.87	11.3	4.67
SCV	0.26	0.36	2.5	0.41	0.11

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

Table 7

	ANGINA				
	DENMARK	ENGLAND	PORTUGAL	SLOVENIA	SPAIN
Cases	5,507	55,805	2,303	661	20,856
Stand. Rate	22,08	24.29	5.45	10.23	1.9
EQ5-95	4,41	2.68	4.88	9.74	4.41
SCV	0,69	0.73	0.56	0.26	0.25

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: ECHO countries 2009); EQ: Extremal Quotient; SCV:Systematic Component of Variation;*

APPENDIX 1:

Tables Denmark 2009

Table 8

	Asthma	CHF	COPD	Dehydration	Diabetes	Angina	All PAH
Cases	2,029	6,420	14,206	6,906	406	5,507	35,052
Population	4,503,365	2,781,314	4,503,365	875,496	2,781,314	2,781,314	4,503,365
Crude Rate	4.43	22.52	32.81	73.46	1.42	20.57	80.83
Stand. Rate	5.01	22.49	30.67	75.1	1.59	20.42	76.55
sR Min.	1.16	5.27	12.23	27.56	0.31	3.56	40.87
sR Max.	47.62	50.6	47.44	170.79	7.25	59.08	123.44
sR. P5	2.12	8.53	17.6	37.01	0.4	5.79	51.7
sR. P25	3.02	16.3	25.3	51.7	0.86	11.72	65.43
sR. P50	4.21	21.02	31.39	69.36	1.32	18.13	74.39
sR. P75	5.52	28.4	36.15	96.41	2.06	27.74	91.17
sR. P95	8.61	36.88	43.26	127.41	3.14	39.86	103.92
EQ5-95	4.06	4.32	2.46	3.44	7.86	6.89	2.01
EQ25-75	1.83	1.74	1.43	1.86	2.4	2.37	1.39
ICC	0.01	0.62	0.07	0.50	0.11	0.56	0.48

sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2009); sR Px: percentile x of sR distribution; EQ: Extremal Quotient; ICC: Intra class Correlation Coefficient

Table 9

	Asthma	CHF	COPD	Dehydration	Diabetes	Angina	All PAH
SUR Mín.	0.25	0.2	0.38	0.34	0.21	0.17	0.53
SUR Máx.	3.38	2.15	1.53	2.17	5.08	2.99	1.56
SUR P5	0.49	0.38	0.57	0.49	0.27	0.29	0.64
SUR P25	0.67	0.69	0.82	0.68	0.56	0.58	0.83
SUR P50	0.92	0.91	0.99	0.88	0.91	0.94	0.94
SUR P75	1.22	1.23	1.14	1.2	1.42	1.43	1.18
SUR P95	1.8	1.57	1.37	1.57	2.09	2.06	1.33
SCV	0.16	0.12	0.05	0.11	0.24	0.3	0.05

SUR:Standarised Utilisation Ratio (observed/expected); SUR Px: percentile x of the SUR distribution; SCV:Systematic Component of Variation

APPENDIX 1:

Tables Denmark 2002-2009

Table 10

	ALL PAH							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	42472	40583	38442	37997	37949	35665	34868	35052
Stand. Rate	96.93	93.24	88.93	88.41	89.2	84.9	83	81.86
sR Q1.	97.67	93.96	89.17	85.78	87.15	81.91	82.59	79.65
sR Q5.	97.24	99.69	95.26	95.96	98.76	91.97	86.76	91.62
SCV	0.05	0.04	0.05	0.05	0.06	0.06	0.07	0.06

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

Table 11

	Asthma							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	2408	2281	2251	2204	2301	2223	2018	2029
Stand. Rate	5.63	5.24	5.31	5.18	5.32	5.16	4.76	4.74
sR Q1.	5.56	4.95	5.12	4.89	4.23	4.92	4.11	4.73
sR Q5.	5.56	5.56	5.09	5.37	5.24	5.21	4.97	5.01
SCV	0.1	0.11	0.15	0.14	0.23	0.17	0.22	0.14

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

Table 12

	CHF							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	7754	7881	7542	7560	7495	6371	6357	6420
Stand. Rate	30.2	29.9	29.25	29.75	29.76	25.33	25.16	25.53
sR Q1.	28.18	26.42	26.07	26.48	28.80	27.39	30.94	27.38
sR Q5.	38.18	42.70	42.74	41.86	40.46	27.50	26.87	31.53
SCV	0.11	0.17	0.29	0.31	0.34	0.07	0.1	0.14

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

APPENDIX 1:

Tables Denmark 2002-2009

Table 13

	COPD							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	17805	17147	16024	15707	14946	15014	14698	14206
Stand. Rate	40.62	39.34	36.83	35.95	34.33	35.45	34.72	32.91
sR Q1.	43.19	42.55	39.23	35.98	35.12	33.02	32.22	31.46
sR Q5.	35.18	35.67	33.13	33.42	35.56	36.96	34.13	32.78
SCV	0.1	0.12	0.1	0.07	0.07	0.09	0.07	0.05

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

Table 14

	Dehydration							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	4065	4145	4137	4398	5528	5363	5983	6906
Stand. Rate	50.67	55.12	54.76	57.51	73.01	71.1	78.81	88.33
sR Q1.	48.75	57.07	53.74	61.77	68.14	66.55	75.72	79.73
sR Q5.	54.88	61.41	55.30	55.52	83.33	79.47	79.85	115.38
SCV	0.13	0.14	0.14	0.09	0.1	0.17	0.2	0.14

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

Table 15

	Diabetes							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	310	348	331	381	324	360	402	406
Stand. Rate	1.37	1.6	1.45	1.67	1.5	1.81	1.8	1.77
sR Q1.	1.02	1.54	0.99	1.38	1.55	2.39	1.55	1.50
sR Q5.	1.44	1.52	1.62	1.78	1.24	1.09	1.44	1.48
SCV	0.05	0.21	0.13	0.22	0.43	2.12	0.04	0.25

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile of sR distribution; SCV:Systematic Component of Variation;*

APPENDIX 1:

Tables Denmark 2002-2009

Table 16

** sR: Age-sex Standardised Rate per 10,000 inhabitants (Reference population: national 2002); sR Qx: quintile*

	Angina							
	2002	2003	2004	2005	2006	2007	2008	2009
Cases	10452	9152	8456	8113	7695	6748	5802	5507
Stand. Rate	40.86	35.74	33.73	32.69	32.46	28.46	24.32	22.69
sR Q1.	40.38	35.54	33.43	30.66	30.63	26.40	23.86	22.52
sR Q5.	40.21	36.38	36.00	36.88	31.52	31.66	28.02	25.38
SCV	0.11	0.09	0.09	0.16	0.26	0.31	0.31	0.33

of sR distribution; SCV:Systematic Component of Variation;

APPENDIX 2:

Technical note

Potentially avoidable hospitalisations are conceived as geographical indicators, within the ECHO performance model.

This fact entails some implications, both for methodology and in interpreting results. The report is based on ecologic analyses –data aggregated at a certain geographical level which becomes the unit of analysis for this report; thus, the correct interpretation of the findings highlights the risk of being exposed to avoidable hospitalisations for the population living in a certain area (as opposed to the risk for an individual patient).

Main endpoints:

This report maps out standardised utilisation rates per geographical area. As a summary measure of variation, the report includes the classical statistics Ratio of Variation and Component of Systematic Variation.

Instruments:

Being an ecologic study, each admission was allocated to the place of residence of the patient, which in turn was referred to a policy relevant geographic unit – the 98 kommuners and the 5 Regions building up the Danish National Health System.

The operational definitions for each indicator are detailed in the coding table in appendix 3. Indicators are based on those in use in the international arena as proposed by AHRQ and OECD. For its use in the analysis of variations across countries they were subject to a construct validity process developed by the Atlas VPM project in Spain and cross-walking across different diseases and procedures classifications underwent a face-validation carried out as a task within the ECHO project.

This report is based on the hospital admissions registered in the National Discharges Dataset (Ministeriet Sunhed Forebyggelse). Cross- and in-country sections were built upon 2009 discharges, whereas time-trends and social gradient analyses used 2002 to 2009 data.

Social gradient data were obtained from the National Statistics office (Danmarks Statistik Statistikbanken) data for kommuners on average family annual income (both based in transfers and available) was obtained from the Statistikbanken. For regions, transfer and available income were calculated as the weighted average of the individual kommuners/municipalities values.

APPENDIX 3:

Definitions of indicators

	Diagnosis codes ICD10 and Procedures codes Nomesco					
	Primary diagnosis		Secondary diagnosis2-30		Procedures	
	Inclusions	Exclusions	Inclusions	Exclusions	Inclusions	Exclusions
Asthma +18 Age	J45 J46 J960 IF "diag2-30"=A		A) J45	Pregnancy, childbirth and the puerperium: O00-O99 CHF: I50 I099 I110 I130 I132 Cystic fibrosis: E840-E849 Q251-Q254 Q30 Q31 Q32 Q33 Q34 Q39 Q893 P26 Mental disorders: F10-F19 F20 F21 F22 F23 F24 F25 F29 F30 F31 F32 F33 F34 F38 F39 F40-F45 F44 F48 F50-52 F54 F60 F63 F68 F28 F53 F55 F59 F61 F62 F69 Respiratory diseases: J47 J8410 J98 J99 COPD: J411 J418 J42 J43 J44 J47		
Congestive Heart Failure +40 Age	I09.9 I11.0 I13.0 I13.2 I50			Pregnancy, childbirth and the puerperium: O00-O99 COPD: J411 J418 J42 J43 J44 J47 Ischaemic disease: I20 I21 I22 I24.0 I24.8 Kidney failure: I12 I13.1 N17 N18 N19		

	Diagnosis codes ICD10 and Procedures codes Nomesco					
	Primary diagnosis		Secondary diagnosis2-30		Procedures	
	Inclusions	Exclusions	Inclusions	Exclusions	Inclusions	Exclusions
Chronic obstructive pulmonary disease (COPD) +18 Age	J42 J43 J44 J47 J411 J418 J20 IF DX= "A)" J40 IF DX= "A)" J960 IF DX= "B)" J969 IF DX= "B)"		A) J42 J43 J44 J47 J411 J418 B) J42 J449 J47	Pregnancy, childbirth and the puerperium: O00-O99 CHF: I50 I099 110 I130 I132 Cystic fibrosis: E840-E849 Q251-Q254 Q30 Q31 Q32 Q33 Q34 Q39 Q893 P26 Mental disorders: F10-F19 F20 F21 F22 F23 F24 F25 F29 F30 F31 F32 F33 F34 F38 F39 F40-F45 F44 F48 F50-F52 F54 F60 F63 F68 F28 F53 F55 F59 F61 F62 F69		
Dehydration Admission +65 Age	E86 E870 E871					
Diabetes short-term complication +40 Age	E10.0 E10.1 E11.0 E11.1 E13.0 E13.1			Pregnancy, childbirth and the puerperium: O00-O99 Mental Disorders: F10-19 F20 F21 F22 F23 F24 F25 F29 F30 F31 F32 F33 F34 F38 F39 F40-F45 F44 F48 F50-F52 F54 F60 F63 F68 F28 F53 F55 F59 F61 F62 F69		
Angina without procedure +40 Age Urgent admissions	I20.0 I24.0 I24.8 I20.8 I20.1 I20.9			Pregnancy, childbirth and the puerperium: O00-O99		Cardiac Procedures (Annex 1)