# Concerning the dataset “tst.tsv”

## Background

This dataset concerns prescribing of the male sex hormone *testosterone* at primary health care centres (vårdcentraler, PHCC) in the Västra Götaland (VG) region. Testosterone has a number of medical uses, chiefly for men with congenital deficiencies such as Klinefelter’s syndrome. There is, however, an increasing use for medically dubious diagnoses such as “male menopause”, “late-onset hypogonadism” and “low-t syndrome”. These consist of an ill-defined collection of symptoms such as “decreased energy” and “less enthusiasm”, for which there is no evidence whatsoever that testosterone is a reasonable treatment. As the male sex hormone is linked to side effects such as cardiovascular disease (possibly the reason for males being more susceptible to myocardial infarction, etc, than women), such use is of great concern.

Nevertheless, some prescribers have a very liberal view of who should be prescribed testosterone, and there are even specialized one-purpose clinics that direct their marketing mainly to middle-aged men, promising a quick fix to their health problems through sex hormone treatment. These clinics frequently sell “kits” of testosterone lab analyses and, when results turn out to be below some rather arbitrary cut-off level, offer customers prescriptions of testosterone.

## Aims

* To describe the development of testosterone prescribing over time in the VG region.
* To analyse trends in testosterone prescribing in relation to the number of registered patients at the PHCC.
* To measure any effect of the PHCC’s geographical location, such as a north-south gradient, and possible “contagion” between nearby PHCC’s.

## Desired outcomes

* Univariate and multivariate analyses of the above aims.
* Visualization of different PHCCs’ prescribing over time, preferably interactive, e.g. using R geospatial packages “ggplot2”, “leaflet” and “shiny” (see “example1.png” for idea).

## Possible extension

* Information on what company runs the PHCCs is available from the API below (variable “foretag”), a comparison could be made between PHCCs run by the region (Närhälsan), non-profits (Bräcke Diakoni) and private enterprises (all others), as well as the size of these companies measured by number of owned PHCCs.
* Socioeconomic data could be added from official sources (e.g. through post code) and used as a co-variate to investigate any urban-rural or wealthy-poor gradient.

## Dataset description

The dataset “tst.tsv” consist of 1933 lines exported from the databases “Digitalis” and “VEGA”, (thanks to pharmacist Sofia Axia Karlsson for help with this!), as a tab-separated text file. The variables DDD and Prsc are masked as “x”, for reasons of confidentiality, where the number of outcomes are ≤5 unless zero.

1. PHCC : name of primary health care centre (n=211)
2. Code : unique code of PHCC (in case of name change)
3. Year : period, 2011–2020
4. List : number of patients registered at PHCC that year
5. DDD : number of defined daily doses of testosterone per year, collected by patients **§**
6. Prsc : number of prescriptions per year collected by patients **¶**
7. Xcor : x-coordinate of PHCC **†**
8. Ycor : y-coordinate of PHCC **†**

§ What one DDD of testosterone (ATC-code: G03BA03) is depends on the way it is administered, the available routes in Sweden are parenteral (injection) and transermal (gel), see table, source: [WHO DDD](https://www.whocc.no/atc_ddd_index/?code=G03BA03).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ATC code | Name | DDD | Unit | Adm.R | Note |
| G03BA03 | testosterone | 0.12 | g | O |  |
|  |  | 18 | mg | P |  |
|  |  | 0.12 | g | R |  |
|  |  | 60 | mg | SL |  |
|  |  | 50 | mg | TD | gel |
|  |  | 3 | mg | TD |  |

Unit: g = gram; mg = milligram

Adm.R: administration route, O = oral, P = parenteral (injection), R = rectal, SL = sublingual, TD = transdermal (gel/patch)

¶ One prescription contains varying numbers of DDD, see source: [Swedish pharmacopoeia FASS](https://www.fass.se/LIF/atcregister?userType=0&atcCode=G03BA03)

† The coordinates are availabe through this API, here: [Entryscape](https://vgregion.entryscape.net/rowstore/dataset/70241cef-e111-4b07-bb55-99b5981f47de/html)