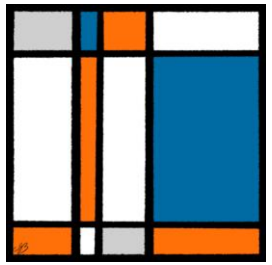
STATENS
VETERINÄRMEDICINSKA
ANSTALT



MATRIX Housekeeping

- 4th to last monthly meeting!
  - Three remain: let me know if you want to lead one
- MATRIX Solutions webinar: 15th September
  - Opportunity to present dashboards/websites
  - Two slots available
- Dashboard information centre (DIC) https://sva-se.github.io/MATRIX-dashboards/
  - Reflect over what should be added/changed
  - Let me know how you can contribute to the content ☺
  - The DIC will be ”glossarified” by OHEJP Glossary
- Deliverables
  - Everyone contributing with a dashboard: please write ~1 page describing its purpose, developments, pros and cons, etc

Communicating surveillance at SVA: now and in the future

Wiktor Gustafsson

MATRIX June meeting, 2022-06-28

Structure

Daily Surveillance Communication

Annual Surveillance Report

Looking Forward: Disease Dashboards

Daily Surveillance Communication

- SVA is Sweden's largest veterinary laboratory
  - Microbiology, pathology, NGS
- Large amounts of daily data
  - Needs to be summarised and translated into actionable information
- SVA's mission: disease surveillance and knowledge communication
  - Maintain disease freedom
  - Keep disease control experts and animal owners informed
  - Give the public insight into our epidemiological situation

Daily Surveillance Workflow

1. Azure cloud environment

   Version control of code and content templates, management of automatic pipelines

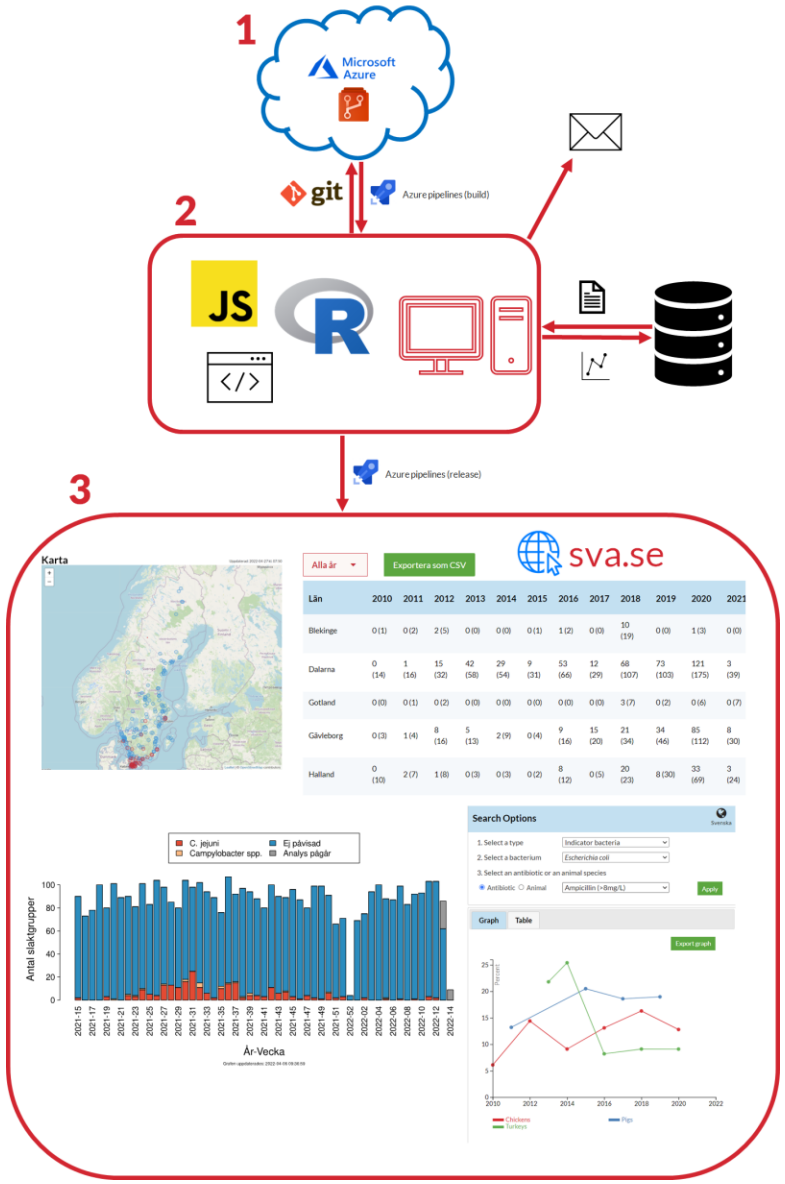
2. On-premise computing

   Development of R packages and templates, execution of pipelines for generating content (build pipelines) and publishing (release pipelines), connection to databases, email notifications

3. Rich web content

   Maps, tables, graphs, “mini-dashboards”

   https://www.sva.se/smittlage



The Annual Surveillance Report

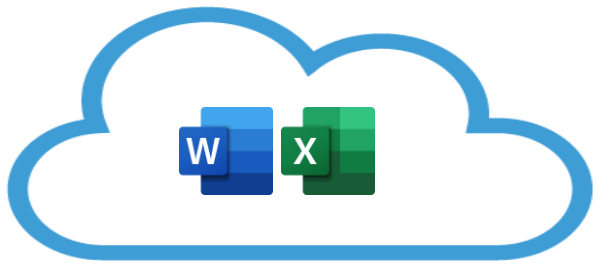
- Annual surveillance summary for >30 diseases and AMR
  - Clinical as well as active surveillance
  - One chapter per disease, chapters authored by experts
- Focus on animal health but includes many zoonoses
  - One Health perspective
- Collaboration between agencies

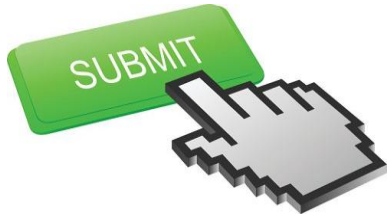
Surveillance Report Workflow

mill R

LaTeX Chapters + LaTeX Chapter typesetting + Tables and figures + LaTeX Report typesetting

Patches

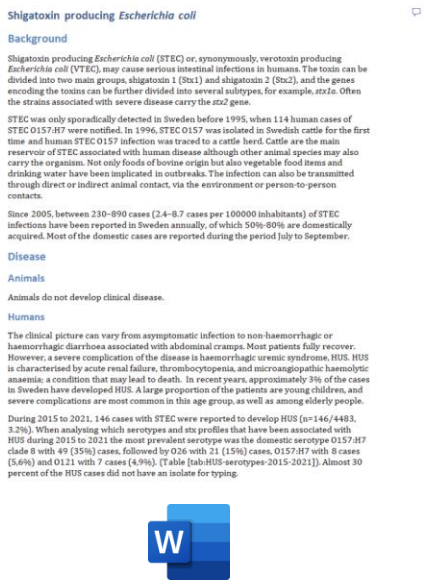




SURVEILLANCE OF INFECTIOUS DISEASES IN ANIMALS AND HUMANS IN SWEDEN 2020

Surveillance Report Workflow

Pandoc (www.pandoc.org)
- A document converter



Shigatoxin producing *Escherichia coli*

Background

Shigatoxin producing *Escherichia coli* (STEC) or, synonymously, verotoxin producing *Escherichia coli* (VTEC), may cause serious intestinal infections in humans. The toxin can be divided into two main groups, shigatoxin 1 (Stx1) and shigatoxin 2 (Stx2), and the genes encoding the toxins can be further divided into several subtypes, for example, *stx1a*. Often the strains associated with severe disease carry the *stx2* gene.

STEC was only sporadically detected in Sweden before 1995, when 114 human cases of STEC O157:H7 were notified. In 1996, STEC O157 was isolated in Swedish cattle for the first time and human STEC O157 infection was traced to a cattle herd. Cattle are the main reservoir of STEC associated with human disease although other animal species may also carry the organism. Not only foods of bovine origin but also vegetable food items and drinking water have been implicated in outbreaks. The infection can also be transmitted through direct or indirect animal contact, via the environment or person-to-person contacts.

Since 2005, between 230–890 cases (2.4–8.7 cases per 100000 inhabitants) of STEC infections have been reported in Sweden annually, of which 50%–80% are domestically acquired. Most of the domestic cases are reported during the period July to September.

Disease

Animals

Animals do not develop clinical disease.

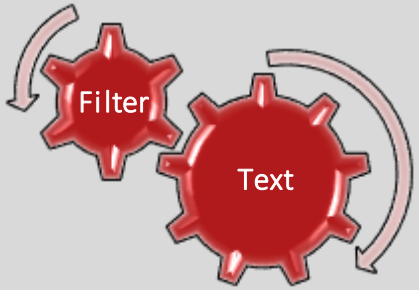
Humans

The clinical picture can vary from asymptomatic infection to non-haemorrhagic or haemorrhagic diarrhoea associated with abdominal cramps. Most patients fully recover. However, a severe complication of the disease is haemorrhagic uremic syndrome, HUS. HUS is characterised by acute renal failure, thrombocytopenia, and microangiopathic haemolytic anaemia; a condition that may lead to death. In recent years, approximately 3% of the cases in Sweden have developed HUS. A large proportion of the patients are young children, and severe complications are most common in this age group, as well as among elderly people.

During 2015 to 2021, 146 cases with STEC were reported to develop HUS (n=146/4483, 3.2%). When analysing which serotypes and stx profiles that have been associated with HUS during 2015 to 2021 the most prevalent serotype was the domestic serotype O157:H7 clade 8 with 49 (35%) cases, followed by O26 with 21 (15%) cases, O157:H7 with 8 cases (5.6%) and O121 with 7 cases (4.9%). (Table [tab:HUS-serotypes-2015-2021]). Almost 30 percent of the HUS cases did not have an isolate for typing.

Pandoc

```
[ Header
    1
    ( "shigatoxin-producing-escherichia-coli" , [] , [] )
    [ Str "Shigatoxin"
    , Space
    , Str "producing"
    , Space
    , Emph [ Str "Escherichia" , Space , Str "coli" ]
    ]
, Header 2 ( "background" , [] , [] ) [ Str "Background" ]
, Para
    [ Str "Shigatoxin"
    , Space
    , Str "producing"
    , Space
    , Emph [ Str "Escherichia" , Space , Str "coli" ]
    , Space
    , Str "(STEC)"
    , Space
    , Str "or,"
    , Space
    , Str "synonymously,"
    , Space
    , Str "verotoxin"
                    :
                    :
```



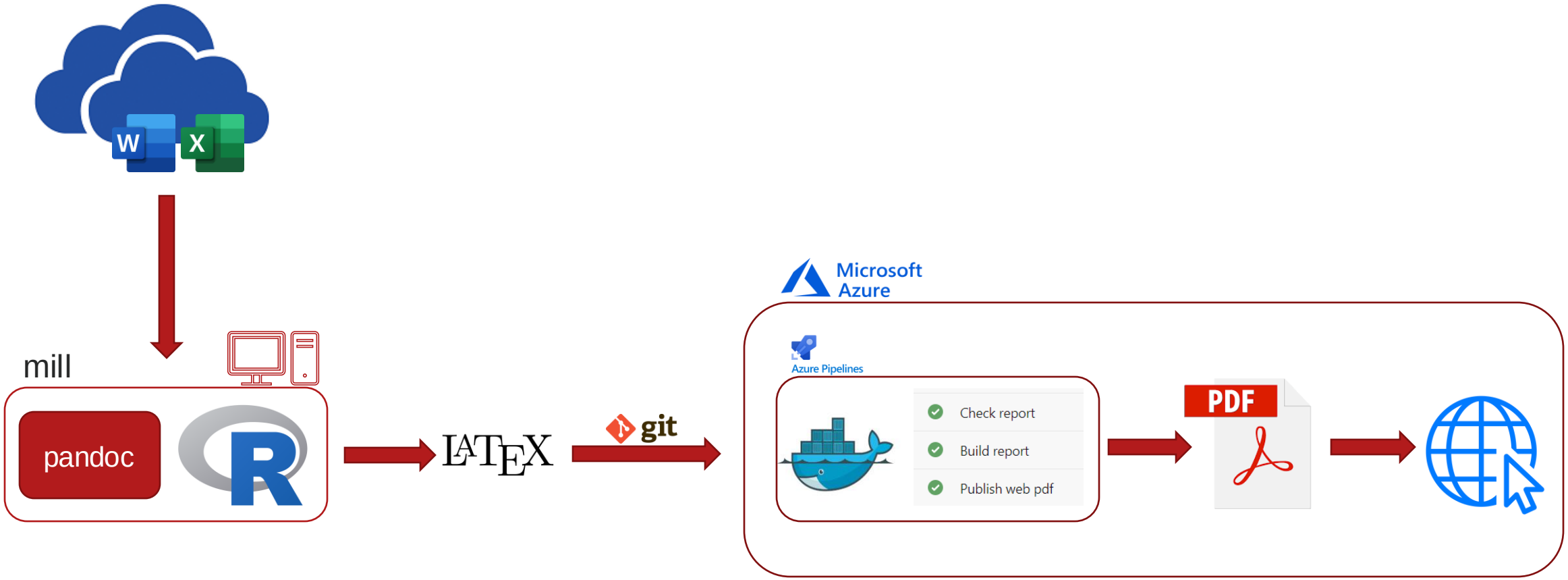
Write output

LaTeX

Build pdf

Shigatoxin producing *Escherichia coli*

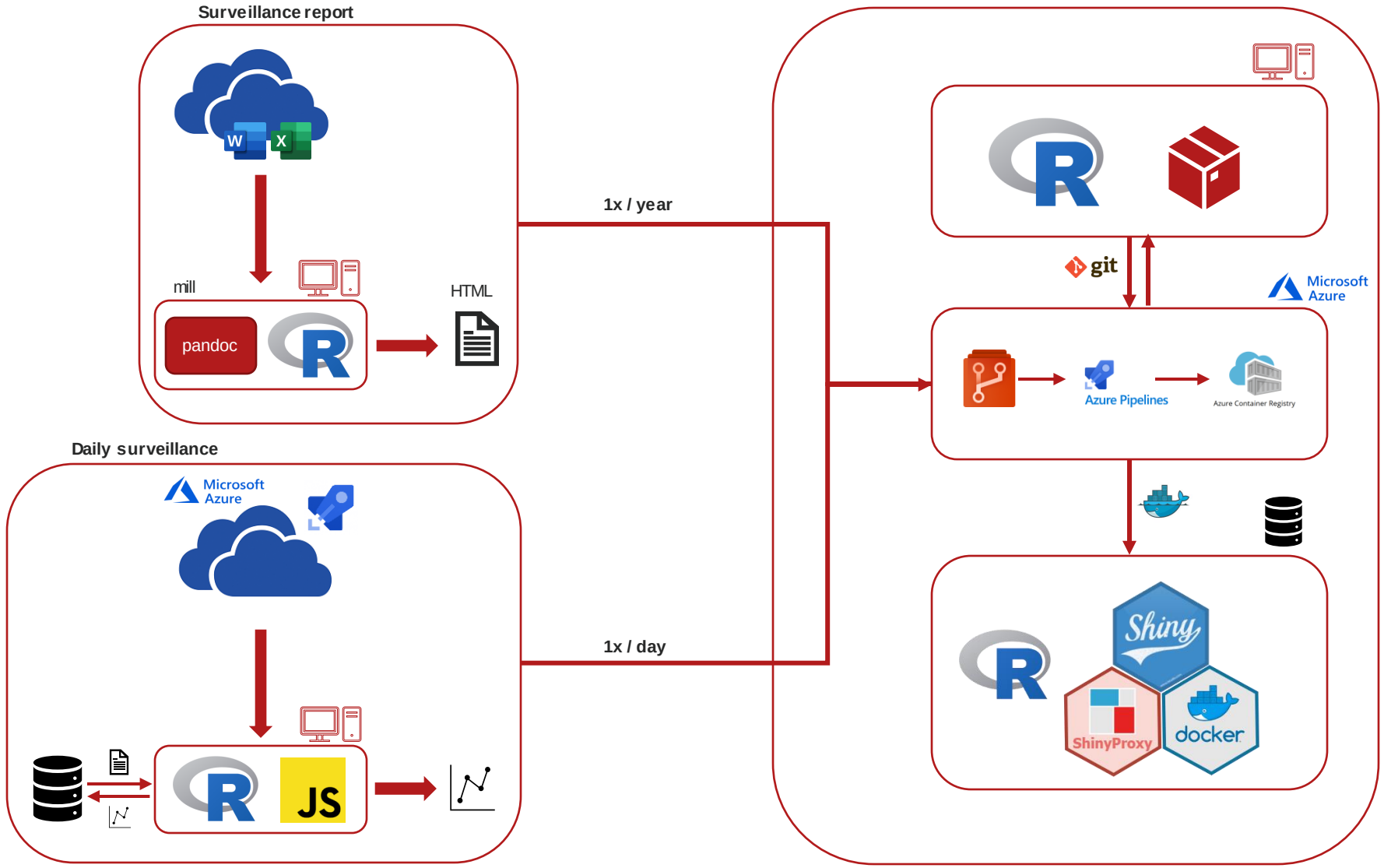
Surveillance Report Workflow



Looking forward: Disease Dashboards

- ”One stop shops” for all surveillance results for specific hazards
  - Annual summaries, daily lab data, syndromic surveillance, …
- Combines and expands upon existing content
- Controlled access
  - Some parts public, others for experts only
- One templade, many hazards
  - Reusable dashboard structure ➔ saves time and work

Disease Dashboards Workflow



First Dashboard Pilot: *Salmonella*

- Currently under development
  - Pilot in fall
- Will have one section per species of interest
  - Cattle
  - Pigs/wild boar
  - Poultry
- Animal focus for now
  - Potential One Health aspect later, collaboration with public health
- Closed access for now (within SVA)
  - Will be used as a tool for surveillance experts
  - Public access later

Thank you for listening!

Any questions?