Curation and Quality Control of Data in EpiFlu™ Database

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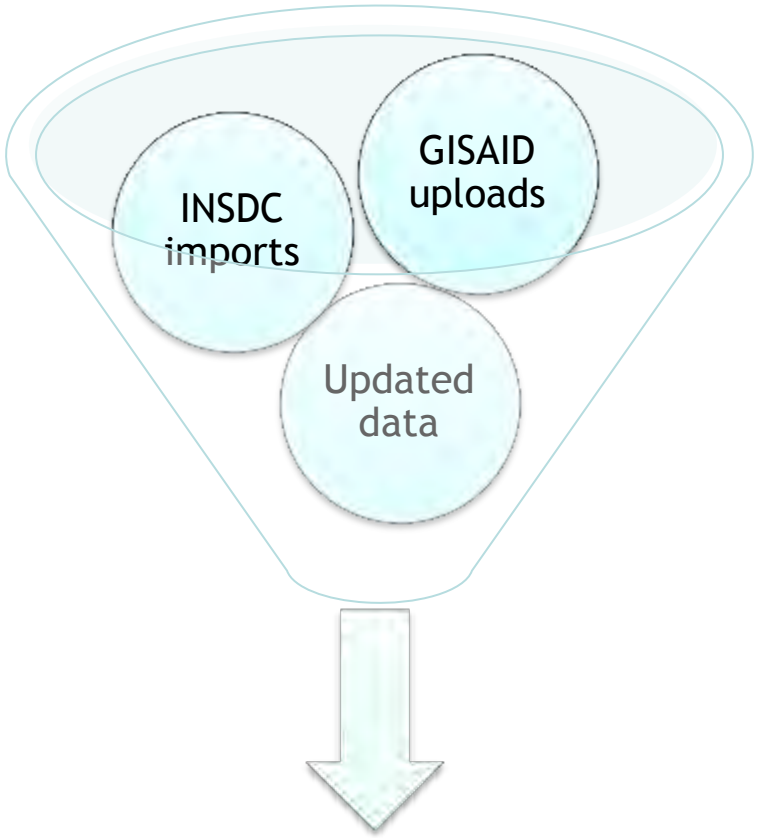
The host of GISAID database

As of 2011 the Federal Republic of Germany represented by the Federal Ministry of Agriculture and Food (BMEL) is official host of the GISAID database

- **Friedrich-Loeffler-Institute (FLI), Federal Research Institute for Animal Health**
  - Content-based data curation
  - Data import and correction
  - Contact point for questions concerning data curation

- **Federal Office for Agriculture and Food (BLE)**
  - Technical operation and maintenance of the database and web server
  - Monitoring and surveillance of worldwide availability
  - Data security and integrity

What data need to be curated?

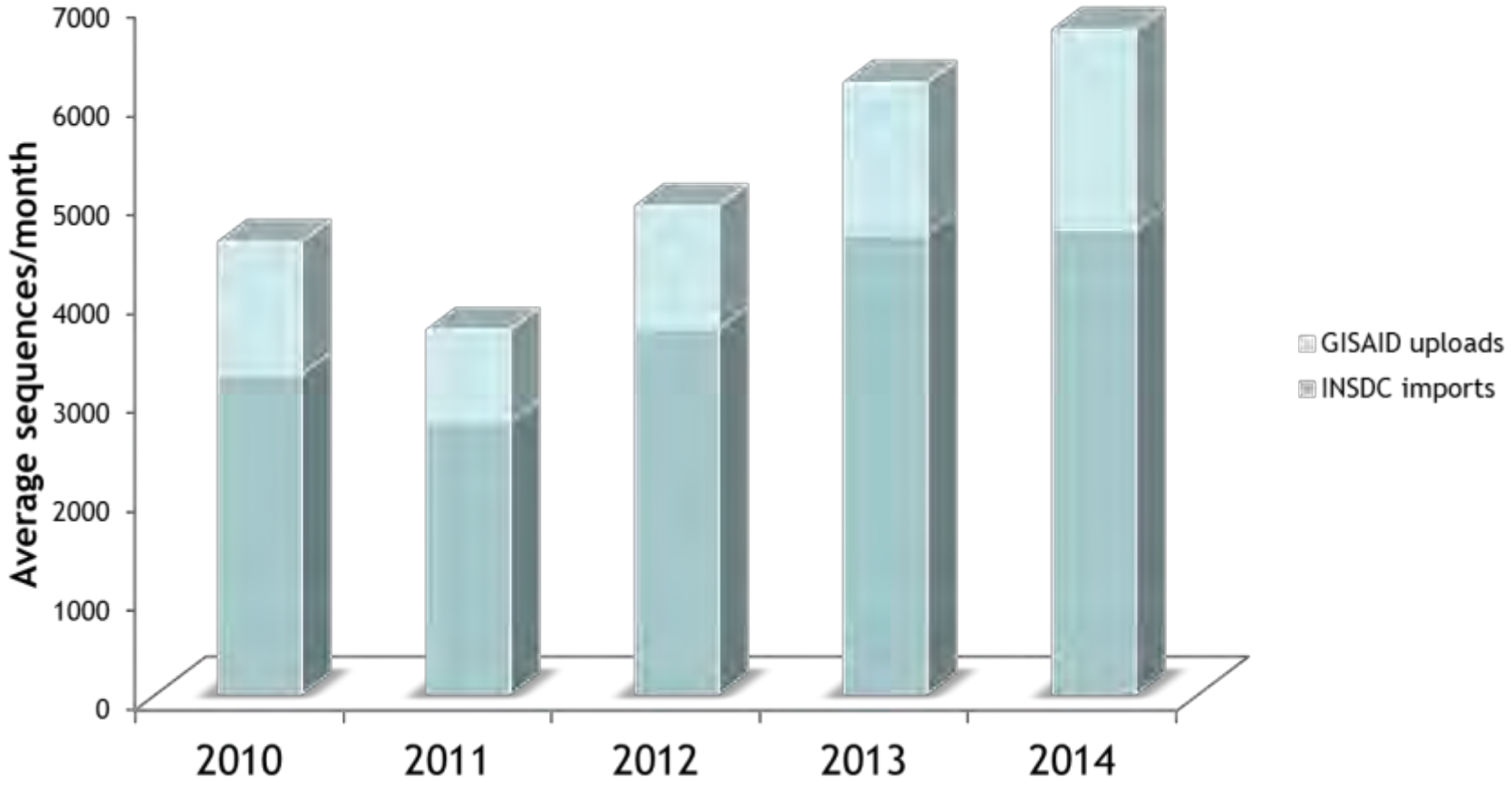


Curated Data

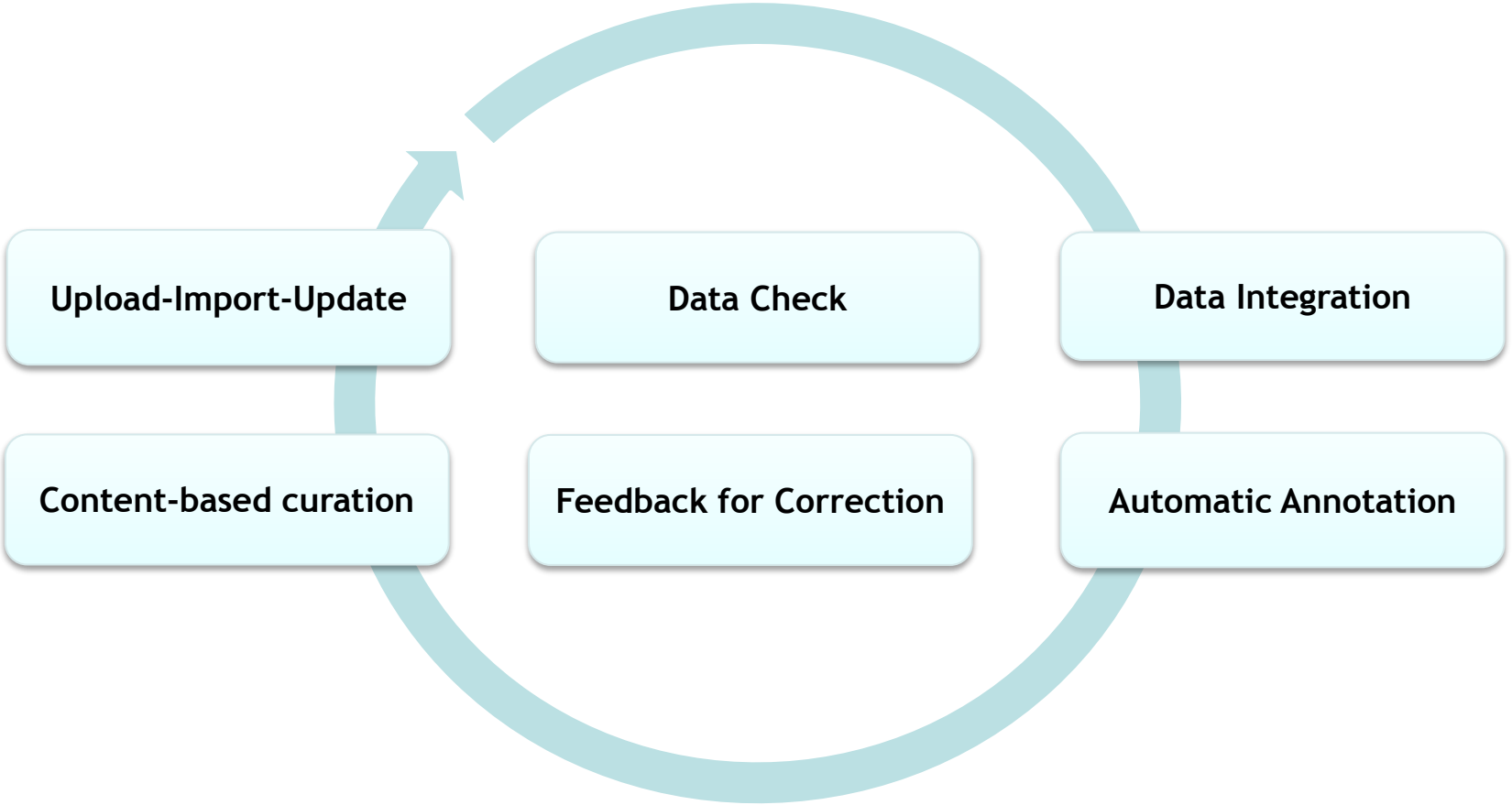
Nucleotide sequences
- Length, code
- Coding sequences
- Protein sequences
- …

Virus information
- Type, subtype, lineage
- Dates
- Host information
- Geographic information
- Resistance information
- Antigenic information
- …

How many data needs to be curated?



Data curation is an interactive and iterative process



Upload tools assists submitter to ensure correct and complete data

Data upload:
- Single Upload
- Batch upload

Submitter

GISAID

GISAID published: 4.269 viruses with 8.130 Sequences Total count: 104

Browse | Upload | Workset Management | Administration

Virus

Virus Detail

Virus Name * A/New York/359/2005
Example: A/Wisconsin/2145/2001 or A/chicken/Rostov/864/2007

Passage Category: Cell

Passage History * cell
Example: c1/c2

Harvest Date

Virus Type * A Subtype H: – Choose Subtype N: 1 Lineage: None

Host Group * Human

Host Group options: None, Animal, Environment, Human, Laboratory derived, Unknown

Subtype H options: – Choose –, None, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

Interactive process to improve data quality

Data upload:
- Single Upload
- Batch upload

Upload Check:
- Mandatory fields
- Drop-down lists

Submitter

Data Integration:
Integrates data to GISAID data format and fields

Automatic Annotation:
Segment type, subtype lineages, CDS, protein

Automatic annotation in GISAID 2.0

CLC Qiagen annotation server:

- Automatic annotation of segment type, influenza type and lineages
- Identification of virus subtype from HA and NA segments
- Determination of coding sequences and integration of corresponding proteins

CDC Atlanta H5N1 Clade annotation:

- Designation of clades for H5N1 sequences

Interactive process to improve data quality of GISAID uploads

Data upload:
- Single Upload
- Batch upload

Upload Check:
- Mandatory fields
- Drop-down lists

Data Integration:
Integrates data to GISAID data format and fields

Submitter

Feedback to the Submitter:
Incomplete data, frameshifts, differences in subtype of virus, …
Correction of entries!

Automatic Annotation:
Segment type, subtype lineages, CDS, protein

GISAID database

Data Release:
Submitter releases data to the public

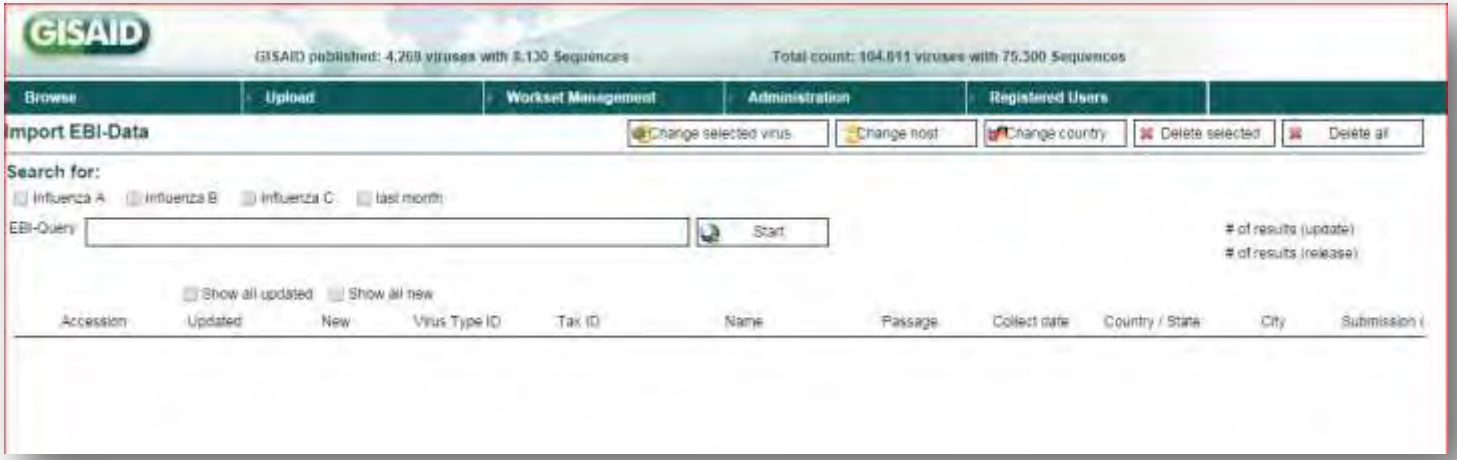
Import and quality control of INSDC data

Data import:
- New Influenza data
- Updated influenza data

Import Check:
- Parse data
- Check data

Curator

Correction by Curator:
Complete data, identification of passages, check for duplication, insert detailed location, use scientific host name (Avian), annotation, …



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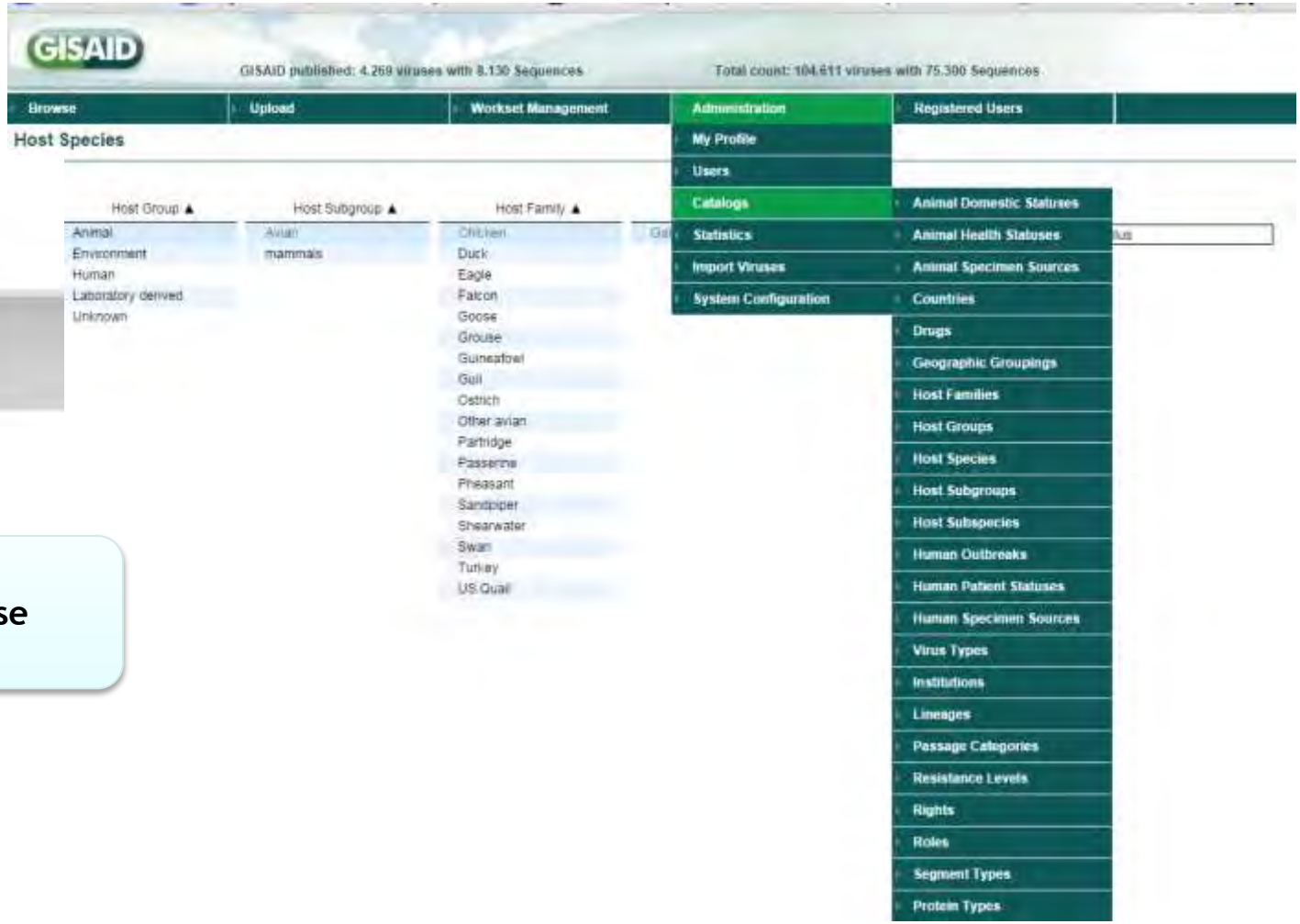
GISAID database

Data Release:
Curator releases data to the public

Curation of Catalogue Content

Admin

GISAID database



Content-based data curation

Curator

GISAID database

Curation

Dedicated software, flexible and dynamic

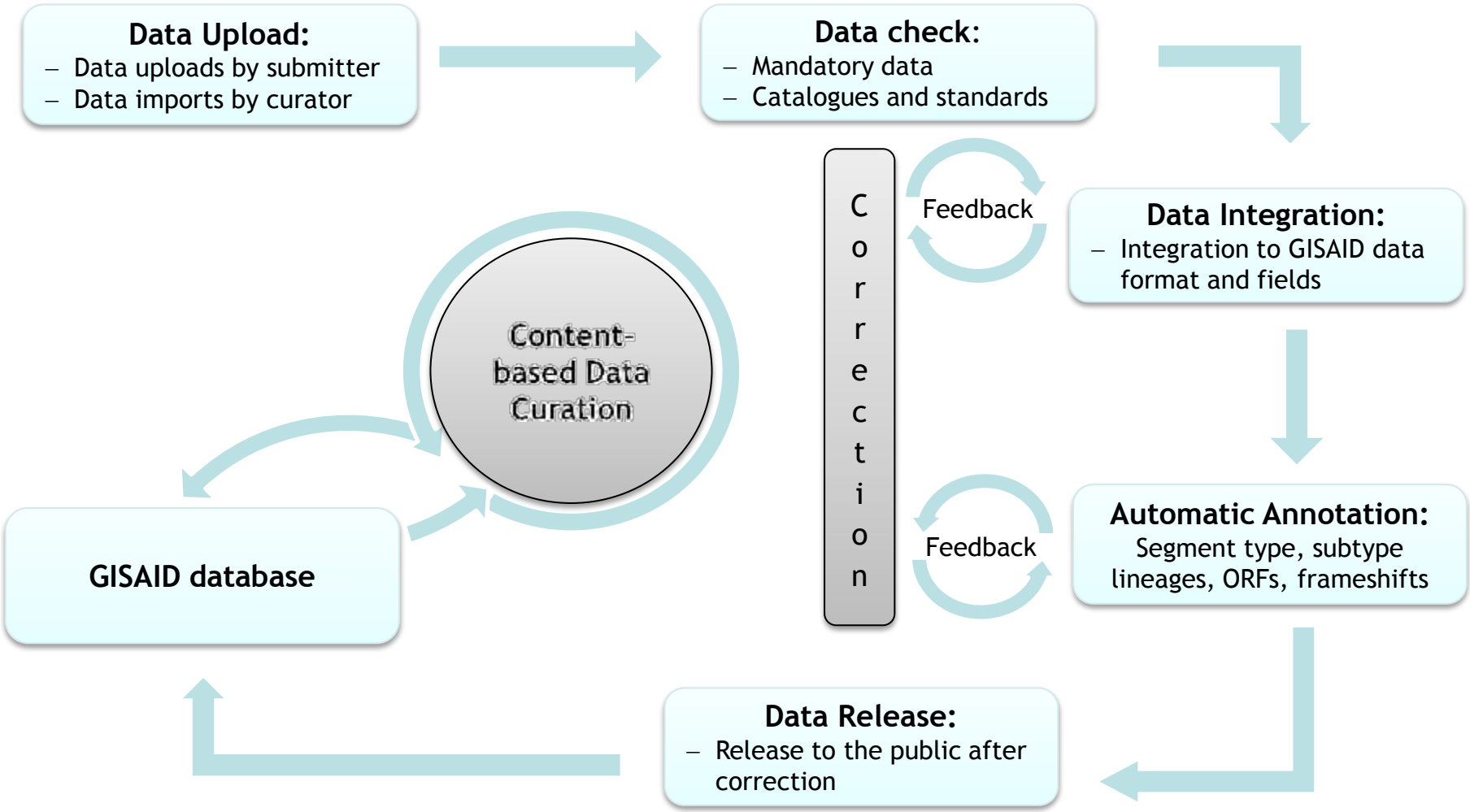
- Find inconsistencies
- Correct entries
- Add information

Isolate_Id	Isolate_Name	Subtype	Lineage	Location	Host	Collection_Date	Update_Date
EPI_ISL_90291	A/Turkey/Germany/R617/2007	A / H6N2		Europe / Germany	Turkey	2011-05-26	2011-05-26
EPI_ISL_90292	A/Turkey/Ontario/6118/1968	A / H8N4		North America / Canada	Turkey	2011-05-26	2011-05-26
EPI_ISL_94864	B/MACAU/200392/2011				Human	2011	
EPI_ISL_94865	B/MACAU/601485/2010	B	Victoria		Human	2010-08-26	2011-08-15

Lack of location

Inconsistent collection date

The GISAID 2.0 Curation Concept



Thanks

FLI | Martin Beer | Dirk Hoeper | Thomas Mettenleiter

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CDC Atlanta | Catherine Smith | Rebecca Garten | Nancy Cox

WHO CC Melbourne | Naomi Komadina

Scopeland | Claudia Peißert | Robert Lembcke | Marko Bacetic

CLC Qiagen | Ben Turner

BII | Sebastian Maurer-Stroh | Raphael Lee Tze-Chuen

Thank you for your attention.

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