Congenital Syphilis and How It Links to Stillborn Pregnancies

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Background

- Congenital syphilis: bacterial infection that is transmitted from mother to child during pregnancy
- Linked to gaps in prenatal care and delays in diagnoses
- Can be prevented in nearly 75% of cases

Reporting

- Stillborn births: loss of pregnancy after up to 20 weeks and before the birth
- Categorized into three categories: early (20-27 weeks), late (28-36 weeks), and term (37 or more weeks)
- Recorded in the County where the death was reported, not where the mother resides
- Information initially collected by the bereavement counselor at the hospital, the funeral home fills in the blanks
- Local health department reviews records, then submits them to the state for death codes
- Must be registered within six weeks of the death
- No frequent financial incentive for parents to need the certificate back

Pipeline

- Can be solved using a data merge function to combine maternal records with stillbirth certificates
- Will match any of the information between the two documents and fill in any gaps
- Preprocessing ensures consistency across the variables, cleaning the different fields before follow-up
- Implement a function to flag any inconsistent information and names that have no matching info
- Input a way to show common, shortened names in case one document has the legal name, and another has the preferred name
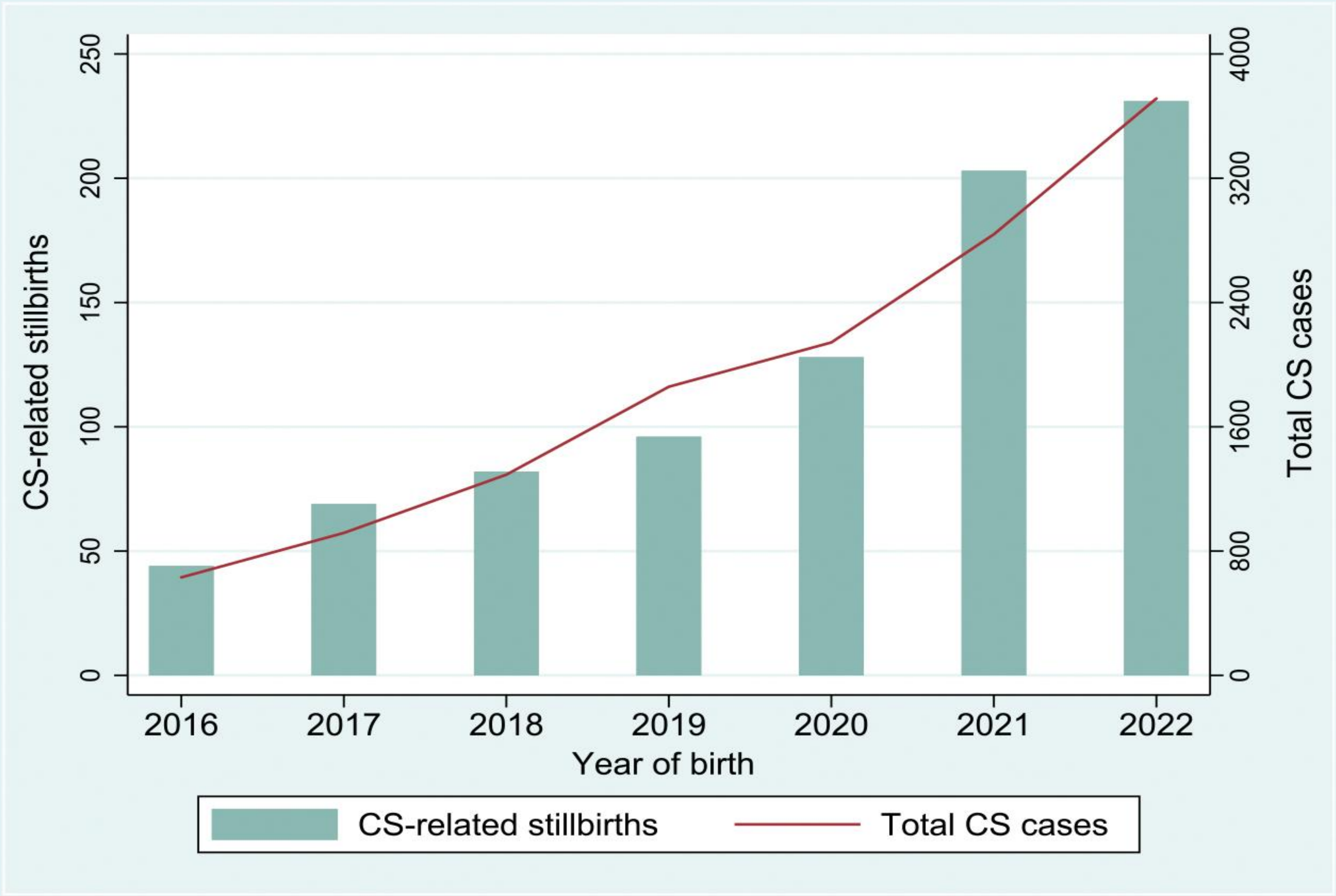- Any records still incomplete remain flagged for human review

Figure 1: Trends in total congenital syphilis (CS) cases and CS-related stillbirths in the United States, 2016-2022 (Machefsky et al., 2024)
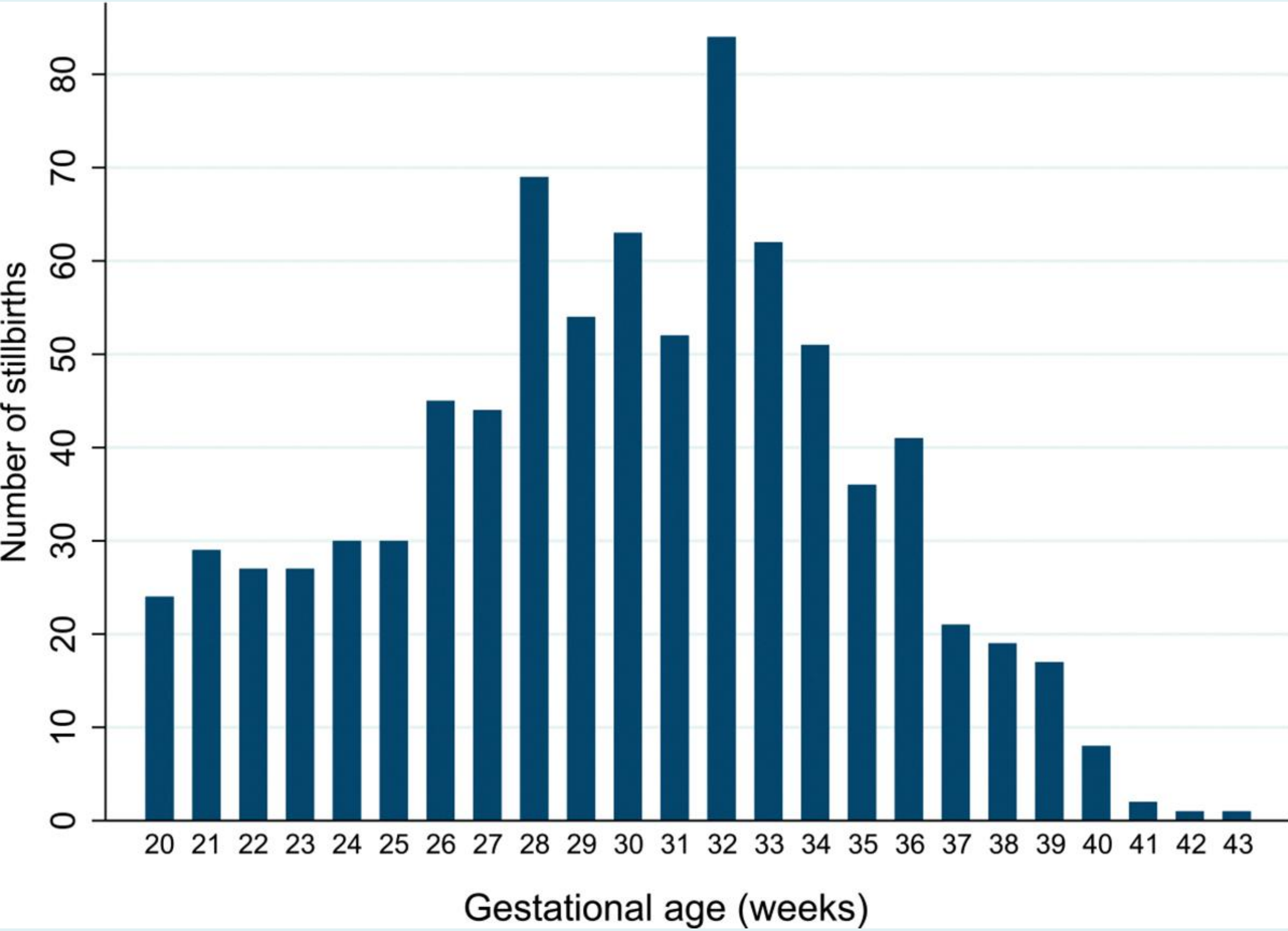

Figure 2: Gestational age (weeks) at delivery for congenital syphilis–related stillbirths in the United States, 2016–2022 (Machefsky et al., 2022)

Breaks down into four stages: data ingestion, preprocessing, matching, and visualization

Collect stillbirth data from the vitals records department

Preprocessing to maintain consistency between the different variables before diving into the matching

Use a data merge function to combine the maternal syphilis cases with the stillbirth records

Implement a function that would flag any mismatched information for another layer of matching

Input a system that would take common nicknames for consistently used names, in case there is a mismatch between legal and preferred names

Any mismatching/ incomplete records remaining continue to be flagged for human review