Data Literacy Series, n.3/2020

The Spectrum of Human Subjects' Privacy

There are different levels of data protection and different strategies for stripping out identifiers that could directly or indirectly re-identify subjects and produce inadvertent harms to them.
The main challenge is to use and share research data while protecting human subjects' privacy.

Types of Identifiable Data

Direct identifiers

Unique to individuals

Examples:

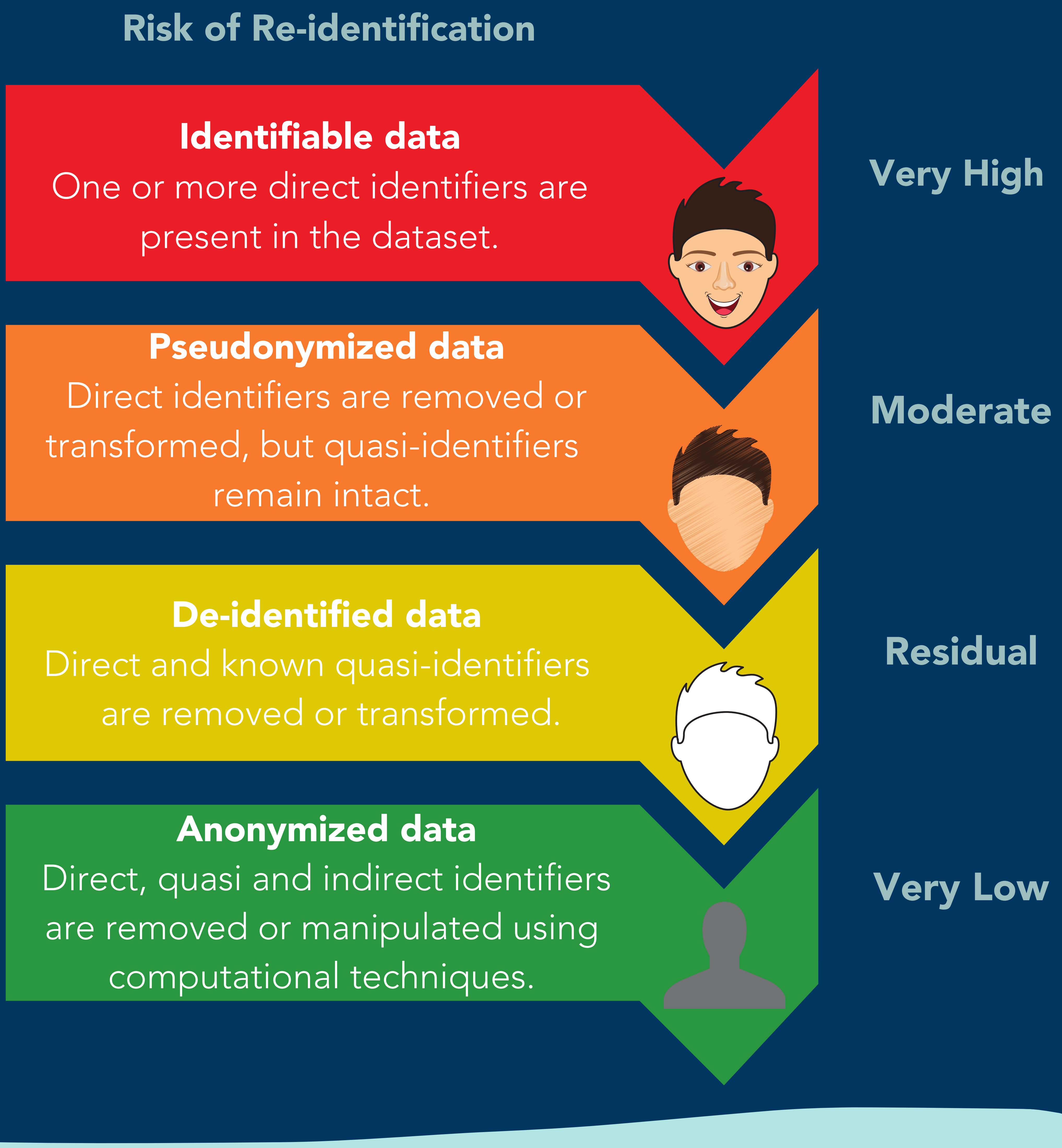
- Name
- Email
- SSN
- IP address
- Phone number
- Full-face images
- Medical record number

Quasi-identifiers

Attributes that combined can disclose one's identity

Examples:

- Race or ethnicity
- Age
- Gender
- Zipcode
- Political opinion
- Religious orientation
- Affiliation/profession



Risk of Re-identification

Identifiable data
One or more direct identifiers are present in the dataset.

Very High

Pseudonymized data
Direct identifiers are removed or transformed, but quasi-identifiers remain intact.

Moderate

De-identified data
Direct and known quasi-identifiers are removed or transformed.

Residual

Anonymized data
Direct, quasi and indirect identifiers are removed or manipulated using computational techniques.

Very Low

Some Techniques to Mitigate Re-identification:

- **Scrambling: mixes or obfuscates letters**
- **Encryption: makes the original data unintelligible and the process is only reversed with a decryption key**
- **Masking: important/unique parts of the data are hidden with random characters or other data**
- **Tokenization: keeps specific data fully or partially visible for processing and analytics while sensitive information is kept hidden**
- **Data blurring: creates an approximation of data values to render their meaning obsolete and/or make it impossible to identify individuals**

Want to learn more? Contact us: rds@library.ucsb.edu

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