Linking SHARE data with AMDC

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Bundesministerium
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Outline

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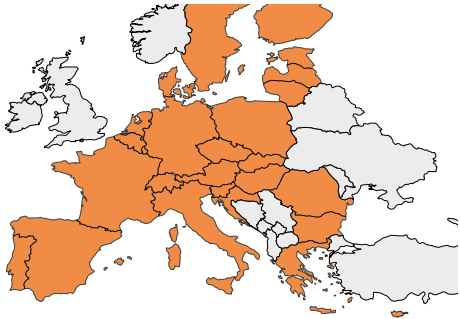
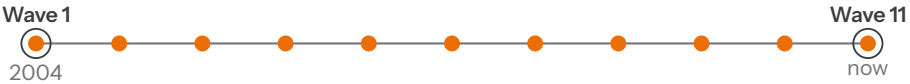
SHARE: Our mission

SHARE SURVEY OF HEALTH, AGEING AND RETIREMENT IN EUROPE
50+ I EUROPA

SHARE – Europe's panel on ageing

- Largest cross-national panel study on health and ageing in Europe.
- Population 50+, biennial face-to-face interviews and medical tests.
- Tracks how health, cognition, financial circumstances, family ties and working life change over time.
- Currently in Wave **11**.





What is at stake

Labour supply

Less labour supply means lower productivity and mounting fiscal pressure.

Living standards

Maintaining living standards means keeping people healthy, engaged, and in work.

Public finances

Unsustainable costs and intergenerational fairness both hang in the balance.

International position

Without adaptation, Austria falls behind its peers.

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Linking to Austrian registers: the AMDC

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Why administrative data?

What (panel) surveys do well

- Subjective health, well-being, quality of work, expectations, and preferences
- Family ties, social networks, informal care arrangements
- Biomarkers and physical tests: cognition, grip strength, blood markers
- Behaviour and attitudes not recorded anywhere else
- Covers *everyone* – also those outside the administrative system

Where registers excel

- **Universal coverage** – no sampling error, no response behaviour issues
- **No recall bias** – employment spells and earnings recorded at the time
- **Longitudinal depth** – employment and benefit histories over many years
- **Linkability** – social security, tax, health, education in one place

SHARE links to the AMDC

SHARE Austria links its individual-level survey data to administrative records via the AMDC.

- This bridges 20+ years of survey responses with administrative ground truth on employment, income, and social security.
- A model that other Austrian surveys can follow.

The research frontier: Linking survey richness to register depth unlocks questions neither source can answer alone – the approach that has driven Scandinavian ageing research for decades.

What AMDC adds to SHARE

SHARE – self-reports

- Health, cognition, well-being
- Family, social networks
- Recalled employment & income
- Subjective expectations

AMDC – administrative records

- Employment spells at daily resolution
- Employer-reported wages
- Pension claims and benefits
- Unemployment, sickness, parental leave

- Validation of self-reports across waves and cohorts
- Career-long earnings histories paired with late-life health
- Quasi-experimental designs that need universe-level admin data (pension reforms, eligibility cut-offs, …)

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The bPK – key to linkage

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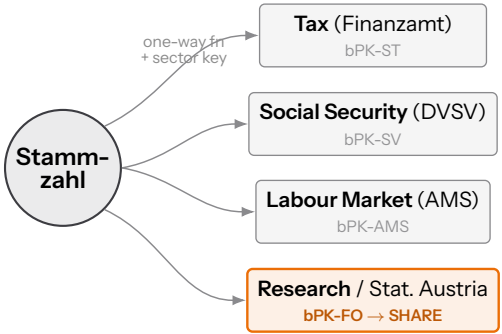
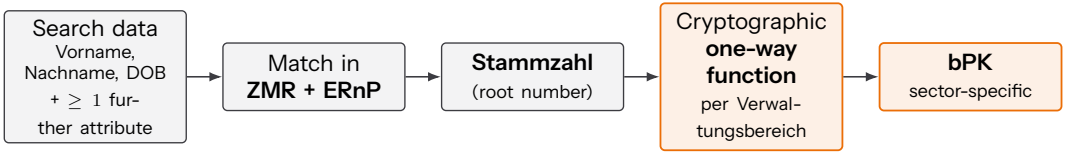
The bPK – a sector-specific personal identifier

- **bPK** – *bereichsspezifisches Personenkennzeichen*: a per-sector identifier for a person. Different for each administrative unit / ministry!
- Derived from the Stammzahl via a one-way cryptographic function – the bPK *cannot* be reversed to recover the Stammzahl.
- For inter-organisation transit, the bPK is additionally encrypted as a **vbPK** with the recipient's public key – only that recipient can decrypt back to the bPK.



Sectors cannot cross-reference each other's bPKs

How a bPK is generated



- Match attributes beyond name + DOB: Geschlecht, Geburtsort, Staatsangehörigkeit, Anschrift / PLZ.
- Run by the SZR (*Stammzahlenregister*) at BMI, under the regulatory authority of the SZRB (*Stammzahlenregisterbehörde*, at BMF).

Note on the encrypted vbPK: each encryption of the same bPK-FO produces a **different** ciphertext (random salt in asymmetric encryption) – two vbPK values **cannot be compared** to check whether they belong to the same person.

How the bPK reaches the AMDC

- Researcher brings SHARE-ID + vbPK AS to the AMDC as part of their data access request.
- Statistics Austria decrypts with the STA private key – only they hold it; SHARE cannot decrypt the vbPK AS.
- SHARE data can be loaded in the remote AMDC workspace and be linked to returned register records.

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Implementation in SHARE Austria

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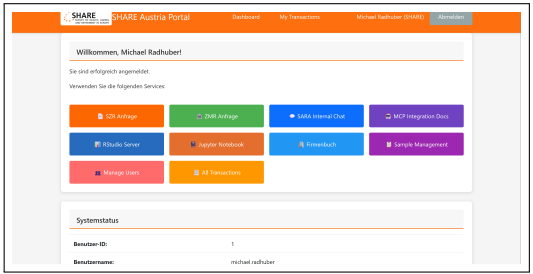
Legal & ethical basis for linkage

- **Legal** – § 2d FOG grants accredited scientific institutions the right to link their data with administrative registers using the pseudonymised bPK. Explicit respondent consent is *not* required.
- **Ethical** – SHARE Austria informs respondents about the linkage at interview and offers a voluntary **opt-out**, going beyond what the law requires.

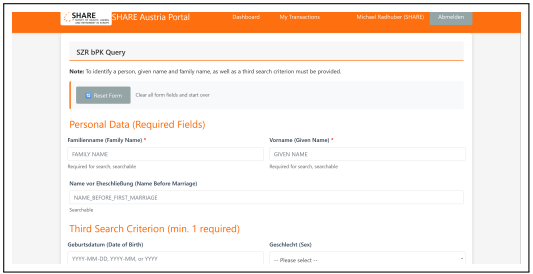
Technical basis – our connection to BMI

- **Encrypted gateway** – direct SSL/TLS connection with a BMI-issued client certificate. No data leaves the encrypted channel.
- **Two registers** – SZR (*Stammzahlenregister*) for bPK retrieval; ZMR (*Zentrales Melderegister*) for address verification.
- **Standard protocol** – SOAP with PVP 1.9, the Austrian e-government auth standard. Access limited to authorised SHARE staff.
- **Audit log** – every query logged and auto-purged after 3 years (GDPR).

SHARE Austria's web portal for register queries



Dashboard – role-based access for authorised SHARE staff only



SZR query form – name, DOB and further criteria submitted to BMI

Practical takeaways – what the merge taught us

Match results (n ≈ 3,000)

- Automatic batch match
- Enriched from sampling data
- Manual case-by-case

All but ~7 entries successfully merged.

The key lesson

- Successful linkage demands **very clean** names, addresses and birth dates at time of interview.
- This is only achievable with high data-quality standards and **in-person respondent verification** – ideally by government-issued ID or passport.
- The match rate is ultimately a function of **knowing exactly who you interviewed** – which requires certainty about respondent identity at the moment of data collection.

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What this unlocks

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What becomes possible

- **Did forcing workers to retire later cost the health system more?** – The Hacklerregelung tightening is a cohort-based natural experiment: link SHARE biomarkers and disability records to pension eligibility dates.
- **Why do Austrian women retire with 37 % less pension – and what does that do to their health?** – Trace parental-leave spells and wage penalties from admin records to late-life grip strength, depression and cardiovascular markers in SHARE.
- **Does your job at 45 predict your dementia risk at 70?** – Match longitudinal occupational trajectories to SHARE cognitive scores across waves.
- **Who paid for the 2004 pension reform with their health?** – Austria's switch to lifetime earnings creates a birth-cohort RD cutoff; SHARE adds the health dimension no register alone captures.

Methodological edge: causal identification (RDD, event studies, DiD) that requires *both* administrative precision *and* survey depth – neither source answers these alone.

Thank you

Questions?

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Backup – placeholder

- Add backup material here for likely Q&A.
- E.g. legal-basis details, consent-text wording, attribute matching rules in ZMR/ERnP, sample sizes, STA-side processing.