nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed
☐	☒ The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒ A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒ The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☐	☒ A description of all covariates tested
☐	☒ A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒ A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒ For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐ For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐ For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐ Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	There is no commercial code used to collec the data. We have primary collected en secondary data both provided in Excel.
Data analysis	All analyses are carried out in Stata version 15.0

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

The data support the findings of this study will be made available upon request. Additionally, we confirm that after acceptance the dataset will be uploaded to the Vrije Universiteit Amsterdam repository DataVerse. It will include all necessary data to replicate the findings presented in the manuscript. However, due to the sensitive nature of the loan history data, appropriate measures have been taken to ensure that individual health facilities cannot be identified or traced from the data.

Research involving human participants, their data, or biological material

Policy information about studies with human participants or human data. See also policy information about sex, gender (identity/presentation), and sexual orientation and race, ethnicity and racism.

Reporting on sex and gender	This manuscript has a gender-specific focus and therefore all results are stratified by gender. Gender information used is reported by the participants themselves.
Reporting on race, ethnicity, or other socially relevant groupings	We do not report on any social groupings. We report on age groups, and have asked survey respondents questions regarding their risk attitude and and perception towards digital loans. We further included health facility characteristics, like location (urban/rural), business size, business type and facility level.
Population characteristics	See above.
Recruitment	Health SME located within the selected five study counties were sampled based on two inclusion criteria: the health SME must be private or faith-based and had been in operation for at least one year at the time of contact. The sampled health SMEs included healthcare facilities (medical clinics, dental clinics or specialist clinics), retail pharmacies, stand-alone diagnostic centers, or facilities providing any combination of these services. One health facility or pharmacy per study county that had information of the owner was selected from open national databases of licensed health facilities and pharmacies maintained by professional regulators 32,35. Subsequently, for the IDIs we applied purposive and snowballing sampling to ensure the inclusion of sufficient female respondents. The anticipated sample size for the IDIs was 24 participants spread across the five study counties, with provision to continue sampling until data saturation was reached. For the survey respondents, we adopted a sampling approach that ensured health SMEs distributed proportionately across the selected study counties. We applied a sampling technique with probability proportional to size for sample allocation. Stratification was carried out based on counties and sub-counties.
Ethics oversight	For the cross-sectional mixed methods approach, ethical approval was obtained from the Strathmore University Institutional Ethics Review Committee, reference numbers SU-ISERC1616/23 and SU-ISERC1890/23. Additionally, a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), permit number NACOSTI/P/23/25096. Informed consent was obtained before the in-depth interviews or surveys began. Additional consent was sort to allow the in-depth interviews to be audio-recorded. All data was anonymized of any identifier information. For the secondary data analysis on the data provided by the MCF, ethical approval was obtained from the Research Internal Review Board of the Erasmus School of Health, Policy and Management in the Netherlands and the AMREF Ethics and Scientific Review Committee in Kenya. For the cross-sectional mixed methods approach, ethical approval was obtained from the Strathmore University Institutional Ethics Review Committee, reference numbers SU-ISERC1616/23 and SU-ISERC1890/23. Additionally, a research permit was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), permit number NACOSTI/P/23/25096. Informed consent was obtained before the in-depth interviews or surveys began. Additional consent was sort to allow the in-depth interviews to be audio-recorded. All data was anonymized of any identifier information. For the secondary data analysis on the data provided by the MCF, ethical approval was obtained from the Research Internal Review Board of the Erasmus School of Health, Policy and Management in the Netherlands and the AMREF Ethics and Scientific Review Committee in Kenya.

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	Mixed-method study
Research sample	Health SME owners in Kenya. Because the survey findings were self-reported this may have led to selection and information bias. The participants were recruited aiming to sample a representative sample.
Sampling strategy	Purposive and snowballing sampling strategies were applied. The sample size calculation was based on a total number of 7,671 private and faith-based health SMEs, and 5,032 private pharmacies in Kenya, assuming a confidence interval of 95%, 5% margin of error, estimate an initial minimum sample size of 373 respondents. This was increased by a factor of 10% to 410 respondents to accommodate non-response. To ensure representativeness, we pursued a proportional distribution of the 410 health SMEs between healthcare facilities and pharmacies.

Data collection	The IDIs were conducted using a semi-structured interview guide and the overarching objective was to gain insights into reasons for (not) taking a loan. The guide was inspired by an adaptation of the PESTEL analysis framework.The IDIs were conducted both face-to-face and via telephone. The venue for the physical interviews was the health SME premises. The interviews were carried out in English and commenced after obtaining informed consent; they lasted between 30 and 60 minutes. Upon consent, the interviews were audio recorded. The survey questionnaire was subsequently developed informed by the findings of the IDIs, to quantify the generated insights of the IDIs. The background characteristics included were respondents' gender, age, education level; health SME type, location and duration of operation. In addition, fed by the qualitative insights and informed by the PESTEL framework we included level of awareness about digital loan products, financial behavior, risk-taking behaviors (adapted from FinaMetrica 38), awareness of lending policies and regulations and lending terms and conditions. The questionnaire was digitized and administered using mobile phones through face-to-face interactions. The data collectors underwent prior training to familiarize them with the tool and ensure adherence to research ethics during data collection. The data collected was transmitted in real-time to a secure encrypted cloud-based database.
Timing	The IDIs were conducted between May and July 2023. The survey was conducted between September and November 2023. We analyzed real-world loan history data of 850 health SMEs including 6,350 disbursed loans between 2011 – 2024 (up to July).
Data exclusions	For the survey data, we had to exclude 29 responses (7% of total sample) because these participants refused to answer the loan history data questions which were key in the analyses. We removed outliers by setting a threshold of EUR 800,000 for term loans, resulting in four exclusions, and EUR 200,000 for digital loans, leading to three exclusions. These outliers were excluded because they were >3 the SD.
Non-participation	None declined participant, only as described above 29 refused to answer questions on loan history.
Randomization	Participants were not allocated to experimental groups.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks	*Report on the source of all seed stocks or other plant material used. If applicable, state the seed stock centre and catalogue number. If plant specimens were collected from the field, describe the collection location, date and sampling procedures.*
Novel plant genotypes	*Describe the methods by which all novel plant genotypes were produced. This includes those generated by transgenic approaches, gene editing, chemical/radiation-based mutagenesis and hybridization. For transgenic lines, describe the transformation method, the number of independent lines analyzed and the generation upon which experiments were performed. For gene-edited lines, describe the editor used, the endogenous sequence targeted for editing, the targeting guide RNA sequence (if applicable) and how the editor was applied.*
Authentication	*Describe any authentication procedures for each seed stock used or novel genotype generated. Describe any experiments used to assess the effect of a mutation and, where applicable, how potential secondary effects (e.g. second site T-DNA insertions, mosiacism, off-target gene editing) were examined.*