

Is there a need to monitor the health statistics of people who farm?

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Abstract

Statistics from all over the world show that agriculture is one of the riskiest work environments in terms of occupational health and safety. In Slovenia, the health statistics on people who farm are of poor quality; only data on occupational accidents are available, and even these are underestimated. This article discusses the need for solid farmer and farm worker health statistics in Slovenia, as well as the obstacles and pitfalls faced by potential data owners and their users. As part of the anthropological research project Changes in Agriculture Through the Farmers' Eyes and Bodies, this study reflects on material obtained in three focus groups with the owners of health and health-related national databases and other representatives of various governmental and nongovernmental agricultural organizations. The results show that research participants are interested in health statistics about people who farm. However, they expand on several factors and circumstances that need to be considered to ensure the quality of data collection, as well as the benefits of such data to farmers and farm workers themselves.

KEYWORDS: occupational health, database, farmers and farm workers, Slovenia

Introduction: What do the statistics say about hazards and risks in farm work environments?

Large population-based health registries used in public health research exist worldwide and serve several important public health, medical research, and health management purposes (Pop et al., 2019); however, they also have several limitations and shortcomings (Inau et al., 2023). Data quality and the extent to which the registry reflects the overall population can vary considerably (Thygesen & Ersbøll, 2014). It is well-recognized that unrepresentative patient populations or missing data can be significant barriers to conducting public health research (Sørensen et al., 2023). The scope and quality of national health data registries vary considerably from country to country, depending on the health care system, the primary reason for data collection, and, especially, how the health care system is funded. In many countries, health care is financed by universal health care systems and partly by health insurance, which means that patient data are generally not centrally collected, are not continuous or representative, and cannot be easily linked to other data sources.

In several countries (including Slovenia), a particularly significant shortcoming of health registries is the lack of data from primary care medical records and their ability to be linked to other datasets, which is of particular interest to regulators, academic, and pharmaceutical researchers worldwide (Birtwhistle & Williamson, 2015; Harron, 2022; Padmanabhan et al., 2018). Despite these shortcomings, health databases and registries seem to remain a key tool for health care delivery and medical research. Therefore, several efforts to overcome their limitations and improve the quality and usability of health data are ongoing, including at an international interoperable level (Meglič et al., 2015; Valentic et al., 2017).

Occupational safety and health statistics regularly report that agriculture ranks as one of the most dangerous occupations (Eurofound, 2017; Eurostat, 2022; ILO, 2015, 2011). Although not always acknowledged, agricultural work has always been demanding, risky, and dangerous. Records of human injury from farm animals can be found, for example, as early as in the Old Testament (Frank et al., 2004), and Swedish archbishop Olaus Magnus wrote in 1555 that threshers could damage their lungs from exposure to grain dust (Magnus 1998, as cited in, Schenker, 2019, p. 3).

However, intensified changes, particularly in the context of industrial agriculture, have greatly increased the magnitude of agricultural hazards. In the United States, for example, public attention to acute occupational farm injuries dates back to the mid-20th century before medicine and public health became involved in this sector (Donham &

Storm, 2002) and in 1940, the National Institute for Farm Safety¹ was founded to address this hazardous reality (Donham & Storm, 2002; Schenker, 2019). The establishment of the Institute of Agricultural Medicine at the University of Iowa in 1955 and of other similar institutions in the 1980s and 1990s (in times of so-called farm crisis) led to the entry of physicians and public health professionals into the field of agricultural health and safety, and the concept and practice of agricultural medicine has gradually spread nationally and internationally (Donham & Storm, 2002; Donham & Thelin, 2016).

The *Agriculture at Risk* report (Donham & Storm, 2002; Donham & Thelin, 2016; Merchant et al., 1989), a collective endeavor of several U.S. public health and safety professional associations, emphasized not only the hazardous nature of agricultural work and the shortage of occupational safety and health (OSH) professionals and training programs at the time, but also the lack of a national OSH research program and funding for such a program. As a result, several sources of data collection related to farmers' and farm workers' health and safety were created in the 1990s; the NIOSH-funded Farm Family Surveillance Project and the Agricultural Health Study (AHS), are still ongoing in renewed form (Donham & Storm 2002; Centers for Disease Control and Prevention (CDC) 2023; Agricultural Health Study (AHS 2023)).

A similar path has also taken place in Europe. The first research institute addressing farmers' occupational health was established in Lublin, Poland (Donham & Thelin, 2016), and the first European survey of the working environment from the early 1990s (Paoli 1992, as cited in Lundqvist, 2000, p. 352) warned that agriculture, along with construction and transport, posed the greatest health risks which was further confirmed by separate national surveys (Hansson et al 1989, cited in Lundqvist 2000).

The European Statistics on Accidents at Work (ESAW) methodology was also developed in the 1990s and applied to Directive 89/391/EEC on the promotion of improvements in the safety and health of workers at work (Eurostat, 2008), which included agriculture as a specific area. In 2004, the project *Magnitude and Spectrum of farm injuries in the European Union Countries* (Trichopoulos et al., 2004) was carried out, aimed at estimating the proportion of injuries and their extent on farms, using the available Eurostat data on occupational injuries in agriculture. The need for a well-organized database on agricultural injuries and morbidity with a well-developed coding system that would allow the study and comparison of data between different countries was particularly highlighted. The authors of this project also emphasized the need to develop these statistical sources fur-

¹ Now it is called the "International Society for Agricultural Safety and Health."

ther to improve their ability to quickly identify trends and design and implement prevention measures.

However, a recent review of the status of statistics on agricultural injuries in Europe (Merisalu et al., 2019)² shows that this development has not yet achieved the desired goal and that the collection of these statistics in EU countries is not yet harmonized, remaining largely underestimated. Based on the Eurostat dataset and national sources for 2013, the review conveyed that the incidence of fatal (FA) and nonfatal (NFA) occupational accidents in agriculture (excluding forestry and fisheries) in selected European countries showed relatively large differences between them. For example, the highest NFA rates (per 100,000 workers) were found in Finland (5,331) and the lowest in Greece (five), while the highest FA rate was reported in Malta (51), and no fatalities were reported in Estonia, Greece, Luxembourg, Slovenia, Sweden, and Iceland. Moreover, Eurostat and national statistics varied significantly in many respects. For example, data for Germany show 89 fatalities in Eurostat statistics but 160 in national sources, while Poland, which has a similar agricultural area and five times more farms and labor force than Germany, reported only four agricultural deaths to Eurostat. Such discrepancies were also found in several other EU countries, which the authors of the review ascribed to the differences in the structure of farms in the EU countries, use of different reference populations, inadequate reporting, different inclusion/exclusion criteria, and unsynchronized interpretation by data users (mixing accident numbers and reference populations when calculating accident rates). They concluded that statistics at the national and EU levels were not well suited to properly address agricultural hazards and risks and to take action.

Agricultural developments in recent decades have convinced numerous scholars in their predictions that working conditions, safety, and health of farmers and farm workers will remain hazardous (Djanian & Ferreira, 2020; FAO, 2022; Goedde et al., 2020; Satapathy et al., 2022). Jones and colleagues (2020) predicted numerous trends that would shape agriculture in the future (e.g., smart agriculture (precision agriculture, digitalization, etc.), climate change and environmental issues, society and consumer trends, labor market and organizational issues, international trade, and economic issues) and pose major demands and challenges for the work and working conditions, having both positive and negative impacts on safety and health of farming people. For example, digitization is expected to facilitate work in agriculture by reducing workload and improving process

² The review was a part of the EU Cost Action Safety Culture and Risk Management in Agriculture (SACURIMA; 2017-2021) project, aimed to explore the reasons why agriculture consistently lags behind improvements in occupational safety and health compared to other major economic sectors (COST, 2023).

control and safety systems management. However, the complexity of information associated with managing multiple alarms or alerts and dealing with complex equipment failures can increase the psychological burden on farmers and farm workers. These and similar examples speak in favor of monitoring such changes and their impact on the farm working environment, health and safety, and the need for collecting suitable data.

An example of how such data might be useful is the large-scale data mining project TRACTOR, which investigated work-related health events, such as reported chronic diseases, and reimbursed drug prescriptions among French farmers and farm workers (Petit et al., 2022). Considering that epidemiological studies have limited scope and coverage in identifying³ various occupational risks and that the results of studies on the health status of agricultural workers are inconsistent (e.g., Demos et al., 2013), the authors of the project used anonymized data from the Mutualité Sociale Agricole [National Fund for Health Insurance of Agricultural Workers and Farmers] (MSA). This administrative dataset covers the entire agricultural labor force, including farm managers/self-employed, employees, retirees, and their families, since health insurance is mandatory for all agricultural workers (active or retired) and their families, and includes four types of health data: data on long-term illnesses, occupational accidents, occupational diseases covered by workers' compensation, and consumption of medicines, health expenditures, and care services. The process of data management-coding, cleaning, and merging has produced a dataset, called TRACTOR, which is supposed to be useful for early detection of current and emerging acute and chronic health conditions in farm workers.

Such a system for collecting, compiling, and making available statistics about people who farm seems beyond reach in the Slovenian context. The data available for the assessment of farmer health, are maintained in the database of the Nacionalni inštitut za javno zdravje [National Institute of Public Health] (Institute of Public Health), based on the ER-8 form (self)reporting on occupational accidents. Analysis of this database (Černič Istenič et al., 2022) revealed that statistics on fatal and non-fatal farm injuries are underrepresented in Slovenia as in several EU countries (Merisalu et al., 2019). Moreover, the Institute of Public Health database only contains records on socially insured persons, including self-employed farmers, while agricultural holdings, which are virtually all (99%) family farms (Statistical Office of the Republic of Slovenia, n.d.), also include a significant proportion of socially uninsured persons, such as pensioners, farmers' spouses, and their children. The fact that these non-socially insured farm groups are also at high risk of injury is confirmed by other sources. Accident and injury data, doc-

³ TRACTOR is an acronym for TRACking and moniToring Occupational Risks in agriculture.

umented by the Ministry of the Interior, indicate that 257 people were fatally injured while working with agricultural and forestry machinery in 2011–2020 (Dolenšek et al., 2021), while the Institute of Public Health database recorded only nine such cases in the same time period. This discrepancy suggests that there are also many more cases among non-fatally injured persons than are officially registered. In addition, the NJIZ datasets lack information on the morbidity of those who work on farms, whether they are socially insured or not.

These facts and particularly the inadequacies of available statistics drove our study, which sought to determine how producers of official data and their users perceive the need for the establishment of a coherent statistical database on accidents, injuries, and illnesses among farmers and farm workers in order to create a comprehensive system to monitor these conditions and trends to take on-time responses.

Research approach

The presented review study about health and related evidence of people who farm in Slovenia is part of the ongoing anthropological research project *Changes in Agriculture Through the Farmers' Eyes and Bodies* (2020-2024). The study had several objectives: to critically assess the availability of occupational health and other health-related databases and surveys on farmers and farm workers; to assess the needs of the interested actors for improved health data for this occupational group; to review the availability, relevance, and usefulness of available databases and variables; and to review the usefulness of available data sources with respect to data submission for the purposes of international comparisons. Those objectives are addressed through the research questions: who among farmers and farm workers (e.g., active/non-active, insured as a farmer/non-insured, registered as a farmer/non-registered, etc.) is included or excluded from the statistically established occupation category of skilled agricultural, forestry and fishery workers; in which other kinds of existing categories or health-related datasets one may identify people who farm; and finally, which datasets have to be compared and harmonized to identify the health status of the active and non-active farmers?

To achieve the above objectives and reflect upon research questions, we used a focus group approach (Denzin & Ryan, 2007; Morgan, 1996). To identify research participants, we at first reviewed offices and departments of agricultural and related affairs, and through brief interviews with database managers and analysts, policy makers, and those interested in health-related databases and surveys we generated a list of potential research participants and determined three target groups: #A group included database

managers, owners and analysts from Institute of Public Health, Zavod za zdravstveno zavarovanje Slovenije [Health Insurance Institute of Slovenia] (Health Insurance), Klinični inštitut za medicino dela, prometa in športa [Clinical Institute of Occupational, Traffic, and Sports Medicine] (Institute of Occupational Medicine) and Kmetijski inštitut Slovenije [Agricultural Institute of Slovenia] (Agricultural Institute); #B group comprised interested representatives from the Inštitut Republike Slovenije za socialno varstvo [Social Protection Institute of the Republic of Slovenia] (Social Protection Institute), Sindikat kmetov Slovenije [Farmers' Union of Slovenia] (Farmers' Union), Kmetijsko gozdarska zbornica Slovenije [Chamber of Agriculture and Forestry of Slovenia] (Chamber of Agriculture), Zveza slovenske podeželske mladine [Slovenian Rural Youth Association] (Rural Youth), and Zveza kmetic Slovenije [Farm Women Association] (Farm Women); #C group included policy makers from the Ministrstvo za kmetijstvo, gozdarstvo in prehrano [Ministry of Agriculture, Forestry and Food] (Ministry of Agriculture), and Ministrstvo za delo, družino, socialne zadeve in enake možnosti [Ministry of Labor, Family, Social Affairs and Equal Opportunities] (Ministry of Labor). Finally, research participants were invited to join discussions in three focus groups. Groups #A and #C were invited to the first group (four participants), #B group to the second group (seven participants), and the third group included five participants from all three target groups.

Focus groups were conducted and moderated in the spring of 2022 by the authors of this paper. The first author asked the initial question and started a discussion, while the second author observed the conversation to ensure that all participants were included and not overlooked, and to ask sub-questions when necessary. In the COVID-19 context, focus groups were conducted via the ZOOM platform. Each session lasted about 90 minutes and was recorded and transcribed *verbatim*.

All participants voluntarily agreed to participate in the group interviews and signed the informed consent, which ensured their anonymity.

The scenarios for all focus groups were designed with the same content structure. Participants were asked to reflect upon 1) a definition of a farmer and to assess their health status; 2) their familiarity with the state of the art of existing health databases or ideas for their future improvements; 3) a question of how to ensure international data comparability. However, within these themes, relevant questions were identified for each group: Group #A (database owners, managers, and analysts) was not specifically asked about the need to establish an occupational disease registry (as this is generally accepted and supported by the profession), whereas #B Group was. In addition, data users were

asked for what purposes they use farmer health data, and how useful it has been to them, while data creators and managers were asked what data users search for from them, who their most frequent searchers are, and which data represent a particular “blank spots”.

Within initial themes, various questions were further discussed. In turn, How to understand the occupational category “a farmer” and who should be included in or excluded from this category; which diseases are particularly characteristic of this occupational group, and in which databases can they be identified; how can people who work on a farm be identified in health registries; to what extent do health registers reflect the actual health status in this occupational group; who is most interested in statistical data on farmers’ health; would it be useful to establish a new routine health database (as a kind of central registry) for this occupational group; what is the current availability, usability, and quality of statistical data on farmers’ health; are there problems in exchanging and linking health data at national and international level; what is the experience with international exchange of health statistics for this occupational group?

The transcripts were read several times, the individual parts were coded, and excerpts on the themes were created. In the next section of the paper, the results and comparisons between groups of participants are presented and shaped in line with the above-mentioned subthemes.

Results

Who should be counted in to get a more comprehensive view of the health status of people working on farms?

Agriculture is associated with some specific health risks. However, for a good epidemiological assessment of the health status of farmers and farm workers, health data must be available in health registers to identify the occupational group of people working on the farm and the activities on the farm.

Slovenian legislation does not distinguish between active farmers and other farming statuses, as the status of a farmer can be defined by various criteria, such as ownership of agricultural land, membership in the Chamber of Agriculture and Forestry, agricultural health and pension insurance, receipt of subsidies, and performing additional farming activities. Research participants agreed that farmer status generally refers to the classification or label given to individuals or entities involved in farming activities by government agencies or relevant institutions. The majority of participants of all three focus groups stressed that a farmer’s status, based on ownership of agricultural land, is not a

reliable indicator of farming activity, as many people own land. In Slovenia, the definition of an active or inactive farmer is ambiguous, as different stakeholders cannot agree on how to define an active farmer. Different definitions of a farmer are used for different purposes. For example, there is a register of farm holds, but not all people who farm are included. The register was created for receiving subsidies and covers mainly those farmers who apply for subsidies and own more than one hectare of land. In this context, research participant C#1 (a representative of the Rural Youth) commented:

So it's difficult to define who is a farmer. But in view of what we have available, maybe the easiest way to define a farmer is that he/she is really engaged in an agricultural activity and is also insured as a farmer. But there are not many of those.

In this context, research participant B#5, also a representative of the Rural Youth, stressed that for several years, a common definition of the active farmer has been sought to facilitate the use of agricultural policy funds and also to allow the creation of databases on farmers. However, she pointed out that despite the proposed solutions, there are still obstacles to overcome:

But, as I said, that's a very uncertain area right now because we cannot agree among us, the stakeholders. But from a practical point of view, and this is my personal opinion, a farmer is somebody who spends a certain amount of time every day doing agricultural production, and that's not exactly gardening, but on a larger scale, something that can be sold.

During a discussion with database (administrator/owner/analyst) representatives, the possibility of identifying a group of farmers within the health insurance database was raised. Research participant A#1 (an Institute of Public Health representative) said that farmers can be found in the category of employees classified in the Standard Classification of Economic Activities as A—Agriculture and Hunting, Forestry and Fishing. However, this possibility exists only in certain cases, “for example, for recording occupational accidents, there is a category in the standard classification of occupations, group 92, i.e., occupations in agriculture.”

Since the combination of farm and off-farm work is widespread in Slovenia, the identification of farmers (farm managers) and farm workers, the vast majority of whom work as family members, poses another problem in the compilation of databases on the farm populations. It is possible to identify farmers in the health insurance databases, for example, those who indicated their occupation in the so-called Form M of the Occupation-

al and Agricultural Insurance, but this information is not always reliable, as research participant A#2 (a representative of the Health Insurance) explained:

It depends on what the person filing the claim indicates. Most of the time, in this case, it is the entrepreneurs, the farmers themselves. If they state their occupation correctly, the information is reliable; if not, then it is not. Sometimes people work in a different occupation, for example, and they indicate a different occupation. So, I know that this information is not completely reliable for that reason.

Furthermore, as research participant B#3 (a representative of the Chamber of Agriculture) noted, it is necessary to take into account certain additional circumstances that complicate the establishment of databases for farmers; for example, when someone who does not make a living from farming inherits a farm and must manage it properly according to the law. Additionally, B#3 stated:

You should know that there are people who take over a farm from their ancestors and then spend all their free time on it, I would say, hobby farmers, taking care of the farmland as required by the Agriculture Law.

The research participants not only identified problems but also proposed some solutions. They suggested some criteria that could be used to define the status of an active farmer: A#1 (an Institute of Public Health representative) suggested that “a farmer is someone who works the land and is able to sell some of his/her produces,” while A#2 (a Health Insurance representative) insisted that it should be “someone who is engaged in an agricultural activity, i.e., farming or raising livestock, and this is his or her main source of income.” Research participant B#2 (a representative of the Farmers’ Union) pointed out that it would be useful to include in the status of farmer those who carry out farming as a secondary activity and earn income that is taxed as a lump sum or as VAT:

In the afternoon, after work or after another activity, some people work on the farm, not only as subsistence workers but also in a commercial activity. A concrete proposal is that anyone who generates at least €100 in gross sales per hectare per year could be an active farmer.

As the focus group discussion on who should be included in the category of farmers to gain adequate insight into the health status of those working in farming revealed the definition of an (active) farmer is a fundamental question for which expert consensus has not yet been achieved. Who belongs to this group is seen differently, depending on the criteria shaped by the “needs” of the actors (government agencies and other related institutions), especially those dealing with issues of agricultural production, its manage-

ment, and financing. The discussion also pointed out that the problems are not only due to the diversity of those involved in farming (some earn their income exclusively from agriculture, others combine farming with other activities as their main or secondary occupation) but also to the fragmented and poorly thought-out procedures for collecting information and data (e.g., self-reporting by those who farm), which often make the data collected inaccurate and, consequently, unreliable. At the same time, discussants provided some solutions: when collecting data on farmers, all persons should be included who practice farming full or part-time or even in their free time, who may or may not be covered by social insurance, and who obtain a substantial part of their income from farming.

How to identify farmers and contributing family members on farms?

Compared to other countries with large farms that also employ workers, in Slovenia, agriculture is dominated by small farms, where family members are often employed off the farm and are not insured as farmers. However, family members, who make up the bulk of the farm labor force, play a vital role in maintaining and carrying out farming activities. Therefore, it is necessary to include these persons in the analysis of health status, as this would provide a more realistic picture of the health of those working on farms.

In this part of the focus group discussion, participants pointed out that particular attention should be paid to young people when identifying those working on farms. In this context, the research participant B#5 (from the Rural Youth) noted:

There are also, let us say, all those young farmers who are not registered as farmers anywhere because they are still pupils or students. That's a large group of people who are going to take over the farms one day ... and their parents are retiring, and they, too, are not registered.

Research participant B#8, also a representative of the Rural Youth, mentioned that the association created a register of young farmers who enter into farming, meaning those who have already taken over and are managing a farm. However, she also pointed out that other people who are also involved in farming but are employed off the farm, as well as people in training, or already retired, are not included in this register. B#5 and participant B#6 (from the Farm Women) emphasized that women, in particular, are frequently overlooked in agriculture, because they do not own the farms, or are not covered by social security. B#5 was quite illustrative:

There have been several discussions about how to ensure that women in agriculture also have access to their own insurance and not just [health] insurance through their partners. The main reason is usually that there is not enough money to insure them, which seems to me to be a major problem in the 21st century.

According to A#5 participant from the Institute of Public Health, a possible approach for identifying contributing family members could be census data. In 2011, the National Statistical Office shifted from a field-based to a register-based census of population, households, and dwellings. Members of the same farm household could be identified if census data were linked to entries in the Ministry of Agriculture farm register or to entries in the Ministry of Labor; the latter maintains a register of recipients of social transfers. Yet such links can be established in the case of using the Enotna matična številka občana [unique personal registration number](EMŠO), which can also be linked to health databases, based on the mandatory Številka zdravstvenega zavarovanja [health insurance number]. However, even at this level, as participants A#5 (from the Rural Youth), A#3 (from the Institute of Occupational Medicine), and C#3 (from the Ministry of Agriculture) noted, certain difficulties may arise. First, Slovenia lacks the appropriate legal basis for collecting this type of sensitive personal data and merging them. Second, it is not necessarily the case that family members actually live in the same household, or farm their own land. As C#3 clearly said:

We have the Register of Agricultural Holdings in the Ministry of Agriculture. Each farm has its own identification number to which the farm owners and members are linked. A large percentage of these, of course, are families. Whether these family members live at the same address, whether their house number is 8a and 8b, or 8 and 8a, needs to be checked more closely, because it is not always entirely clear whether they are members of the same farm household. The land farmed by members of the farm is not always linked to ownership, so the data must be linked to the data of the Ministry of Finance, which taxes the owners of the farmland. In the Ministry of Agriculture, we are ready to create the appropriate legal basis, but at the technical level, we will probably have a lot to do to bring the data to the same denominator. At the moment, certain activities are already underway, where we want to first define the status of a farmer so that we can all talk about the same thing.

This part of the discussion confirmed that other family members on the farm, especially the young people who represent the future of farms, women who are largely excluded from the social security system, and the elderly who are particularly in need of health

and social care, are excluded from the databases. One possible solution pertains to the inclusion of all “missing” and statistically invisible farming groups in a single database in a manner that links the census data to the farm identification number (KMG-MID), national identification number (EMŠO), and health insurance number of the same person who is farming. However, to meet this goal, legal changes (solving the data protection issue) and even more technical solutions are necessary.

Familiarity with health databases and obtaining farmer health data

Research participants in Group #A (database administrators/owners/analysts) largely agreed that there are no high-quality, reliable health statistics in Slovenia that would cover a broader range of people working on farms. From the registers of the Health Insurance and the Institute of Public Health, health data can be obtained only for those farmers and their assisting family members who have social and health insurance on the farm.

According to A#2 (the representative of the Health Insurance), it is possible for socially insured persons and their family members to find out what health services they have received from the public health system or what reimbursements and subsidies they have received. This information is available to them. The problem, however, remains that there is a grey area, the extent of which cannot be estimated, specifically, how many people are engaged in farming but are not covered by social insurance. Similarly, A#1 (a representative of the Institute of Public Health) confirmed that in their dataset on the sector of agriculture and hunting, forestry, and fishing, it is possible to capture those who farm and are socially secured, but not those who farm in their spare time, such as pensioners who are very vulnerable to injury.

Despite several datasets that include farmers, the socially insecure family members are excluded from them and therefore invisible. However, in certain situations, they can be identified from other sources. Such cases, particularly the fatal cases, are captured by the police in their dataset. However, all datasets that include different farmer statuses are not synchronized. A#1 suggested that a special project under the existing Statistical Survey Program would be appropriate in this case.

In the absence of records of the actual proportion of people working on farms, it is not possible to perform a quality analysis of their health status, using data from national health databases. An analysis based on the existing, limited data is more likely to produce biased results. In this discussion, some research participants from the Institute of

Occupational Medicine (A#3) and the Institute of Public Health (A#5) pointed out that certain data (e.g., sick leave, primary and secondary health care services) may be underestimated by 10 to 40 percent.

In addition to the lack of adequate health records on farmers and farm workers, research participants raised the question of the credibility of existing health data on insured farm members, specifically how well these data can be used to assess the actual health status of these people. In fact, the farming profession has some unique characteristics that make farmers and farm workers less likely to seek medical care than other occupational groups. This became very clear in the discussion, in which B#4 (a representative of the Chamber of Agriculture) contributed:

In general, this occupation is mainly chosen by those who are physically and mentally well-prepared at the beginning. However, over time, partly because of the high demands of this profession, they suffer from poor physical and, more recently, mental health. There is a lot of work on a farm, but also a lot of worries, especially on larger farms. There is constant construction work, land purchases, and investments. And if we take into account the aspect of navigation between a farm and a family, this lifestyle leaves certain traces in health. When I have the opportunity to observe the situation, I notice that one or another disease occurs in people between forty and sixty-five years old. Few people are fortunate enough to navigate between right-sizing the farm they live on and taking care of themselves. In the final stages, a well-maintained large farm counts very little. Then, when you are actually alone, you suffer the most destroyed health and relationships.

In this context, research participant A#3 (a representative of the Institute of Occupational Medicine) added that “regarding mental health issues, you will have an extremely difficult time finding a farmer who is seeking treatment or help for mental health issues.” A#1 (from the Institute of Public Health) and B#2 (from the Farmers’ Union) also pointed out that various circumstances, such as lack of support, financial constraints, workload and responsibility, passion and commitment to agriculture, affect farmers’ decisions to less likely take sick leave compared to other professions. A#1 estimated that sick leave data for the agriculture, fishing, and forestry professions counted 10,000 sick leaves for men and over 6,000 for women, which, according to her, were low numbers. Illustrative in this regard was B#2 (a representative of the Farmers’ Union), who explained:

I will be honest. I got COVID-19 last week. I worked all day [on a farm] and only slept four hours all week. You see, work does not wait: it's peak season now.

Farmers often do not seek professional help at all or only go to see the doctor when it is really urgent, or "when he can no longer work," as told by B#5. In this context, A#3 (a representative of the Institute of Occupational Medicine) raised the issue of disability among farmers:

People on farms simply wait indefinitely before initiating disability proceedings, usually after the illness is very advanced. In addition, there is another serious problem. If they have a Category 3 disability,⁴ they are usually certified as no longer being able to work as a farmer, but as being fit for other more suitable work. Category 3 disabled farmers are often around 50 years old and continue to farm because they believe they can.

B#8 (from the Rural Youth) and A#3 (from the Institute of Occupational Medicine) also noted that despite the fact that injuries and accidents are common in agricultural work, these data are seriously underestimated in health statistics because they are underreported. According to B#8, farmers do not seek help immediately when an accident occurs, but sometimes later or not at all. For this reason, these data are missing in the health statistics. Additionally, A#3 believed that injuries that happened to farmers were not properly evaluated:

A farmer never goes to the doctor for a cut, and for this reason, of course, does not fill out the R8 form that is recorded in the Institute of Public Health database. ... Another reason that farmers do not report workplace injuries is that under our Occupational Safety and Health Act, the employer him/herself is responsible for workplace injuries and occupational diseases. If a farmer is self-employed, this means he/she is his/her own employer and has absolutely no interest in reporting an accident if he/she is to blame. The consequence of reporting is that you receive 100 percent sick pay, but the first 20 days of sick leave are always paid by the employer [in this case, by a self-employed farmer].

⁴ According to the Article 63 of the Slovenian Social Insurance Act (ZPIZ-2), disability occurs as a result of changes in health that cannot be remedied by treatment or medical rehabilitation measures, the individual's ability to secure or maintain a job or to advance in his or her professional career is reduced. A disability in the third category occurs when the insured person is no longer able to work full-time but can perform certain work on a part-time basis for at least four hours per day (for a limited period of time), or when the insured person's ability to work in his / her occupation is reduced by less than 50%, or when the insured person is still able to work full-time in his/ her occupation but is unable to work in the occupation in which he/ or she is employed (Grah, 2020).

Although Slovenian legislation requires regular medical examinations for all employees, farmers rarely participate in them. According to research participants' statements, presented below, there are many reasons for this: from the fact that the inspection services do not reach them to the fact that medical examination is an additional financial and time burden for a farmer or not easily accessible to them. These situations are clearly summarized by A#3:

If they are farmholders, they are in the same position as employees. This means that they must undergo a risk assessment, which includes mandatory medical examinations. However, they are usually not included in this examination. Who will punish you when there are 40 labor inspectors in a country only, and more than 210,000 companies? You can quickly calculate how unlikely it is that an inspector will come to check whether the obligations are being met.

B#3 (from the Chamber of Agriculture) added that the law is specific as to the relationship between employees and employers in the case of self-employed persons: "The farmer is his own employer, a one-man band, and therefore, solely responsible for himself." A#5 (from the Institute of Public Health) reminded the discussants that every few years the residents of Slovenia have the right to a preventive check-up in a referring outpatient service financed by the state through compulsory health insurance, and added:

I think it's important that the family doctors in the rural areas, who are close to the farmers, really do a lot for them, so that they do not have to travel to distant cities to be checked.

In this context, B#3 suggested that to improve records on agricultural workers and the agricultural sector itself, a measure should be introduced whereby the state invites farmers and pays for their health and psychological examinations, for example, every five years. This would also allow more reliable studies on the impact of health on other areas of farmers' lives and work.

To summarize, the discussion in this part of the focus group has shown that there are no high quality and reliable statistics on the health status of farmers and farm workers in Slovenia. The existing data are limited to farmers who are covered by social insurance. Therefore, the category Agriculture and Hunting, Forestry, and Fishing does not cover all farmers and is not synchronized with other datasets. This is particularly evident in the case of accidents on farms, where fatal cases reported in the police register are absent from health statistics. It was noted as well that the practice of self-reporting is also a

problem related to insufficient knowledge about work-related injuries on farms. This observation suggests that farm work injury statistics, both fatal and non-fatal, are underestimated.

The discussion highlighted that data reporting sick leave and the use of secondary health care services are also underestimated. This is, in part, due to widespread presentism among farmers since they rarely take sick leave and seek medical help, especially for mental health difficulties, and last but not least, in part due to the inaccessibility of health services. Therefore, the research participants proposed a specific program of statistical surveys and a measure by which the state would invite all farmers, whether covered by social security or not, to free health check-ups.

Who is the most interested in farmer health data, and what are the benefits of health databases for whom?

According to research participants, particularly those from the Institute of Public Health (A#5, A#2), the interest in farmer health data related to specific health indicators, such as sick leave, hospitalizations, occupational accidents, and injuries, is mainly expressed by researchers and journalists, and to a lesser extent requested by the users from municipalities, administrative units, ministries, and commercial enterprises. More interest in data on the health status of farmers and farm workers is expressed by policymakers and various professional farm associations. However, the data are rarely requested from database administrators because those who ask for them are often not well acquainted with the procedures for data obtaining. The representatives of interested professional organizations also expressed some concerns about the usefulness of health data when talking about public awareness of the issue. In the words of B#5 from the Rural Youth: "Data are not what convinces policymakers if media pressure is not strong enough," or B#3 from the Chamber of Agriculture: "Data does not help if policymakers in the relevant positions are not aware of the seriousness of the problem."

The usefulness of health data in determining preventive measures and solving the needs of farmers may also be questionable, as mentioned by research participants from (non-)governmental farm organizations. Since data are based on socially insured farmers, health statistics are underestimated and the issue of data representativeness arises. Although health statistics could represent a good basis for preventive activities, B#1 from the Social Protection Institute emphasized that accessibility to quality health data is not purely a problem for this occupational group:

It's a problem for social care in general and also mental health. Whenever we tried to access the data, we didn't get them. If we had the data, our job would be easier because it would be easier to set up intervention and support activities.

Research participants were concerned about the usability of existing health data in terms of its collection and quality, as well as its potential use. B#3 from the Chamber of Agriculture pointed to the difficulty in obtaining detailed data since only more general information is available. In addition, the data in different data sets does not always match, as A#3 from the Institute of Occupational Medicine mentioned. Access to data, especially for research purposes, is associated with a quite complex process of obtaining permits, especially when it is necessary to link several different databases, and harmonizing data takes time.

This discussion revealed that interest in farmer health data related to specific health indicators such as sick leave, hospitalizations, and occupational injuries is prevalent among researchers, journalists, policymakers, and various associations. However, database administrators indicated that those requesting data are often not well experienced in the procedures for obtaining data. Most research participants agreed that health statistics are biased and unrepresentative because the data comes only from farmers covered by social insurance. However, they also emphasized that the health statistics of farmers could provide a good basis for policymakers in designing preventive health interventions.

Is there a need for a special registry for farmers' health data?

Currently, health data on socially insured farmers are available through two health registries managed by the Health Insurance Institute and the Institute of Public Health. Under the Health Care Data Collection Act (Official Gazette of the RS, 2018), the latter is mandated to collect a large amount of data through administrative databases and surveys. Since, in practice, it is not possible to include all persons working on the farm in the health database but only those who are socially insured, the participants raised the question of whether it would not be more useful to establish a new routine database for farmers' health and other data that would include all persons working on the farm. Considering the high risk of the activities performed on the farms, some focus participants agreed that such a registry would be useful. Or, in the words of A#5 from the Institute of Public Health: "It definitely makes sense because farmers are a vulnerable group, especially due to injuries at work, including fatal ones, which are really very common."

The focus group participants also pointed out that the new registry could be created on the basis of already-existing data, as A#1 from the Institute of Public Health explained:

The point is not to create a new database but to link existing data to a new registry. ... I would add that everywhere these days, the trend is to create registries from existing data. In the case that the Ministry of Agriculture provides us with a list of identifiers (e.g., EMŠO) of people working on the farms, and if there is a legal basis, practically everything that exists about those people can be linked, including their health data.

A#2 from the Health Insurance agreed that such a registry is a necessary tool for monitoring farmer health but difficult to make it:

Anytime we want to know something in more detail or manage it more comprehensively, in this case, farmer health, we want the best data possible. In my opinion, all existing registries were created because there was a need to monitor the advancement of certain phenomena over a time period. Given the interest in farmer health at various levels, I would say that a farmer health registry is necessary and that it would probably make sense to create it, but it is not that simple.

The participants agreed that the data from the registry should be available at both the aggregate and micro-levels and grounded in the appropriate legal basis, as has already been the standard practice in dealing with personal data. Participants from the database managers group further suggested that farmer health data should be linked to the type of agricultural production, as different kinds of diseases occur on farms that differ in size, structure, and type of production, and that such data should be anonymized in cases of research purposes.

In terms of managing the registry and making the data available to interested users, the participants mentioned that data administrators should ensure both organized and usable data, as well as provide analytical and content support as A#1 from the Institute of Public Health: "This is not a one-man job; you need a researcher to do the analysis."

The focus group participants added that the public and non-commercial interested users should be given free access to the aggregated and anonymized data of the new registry. An extra fee should be charged for commercial use (e.g., by the pharmaceutical industry) and for any additional work to prepare and process the data that is not part of routine data work.

The participants agreed that the main priority in setting up a specific registry for monitoring farmers' health is to provide a legal basis for the establishment of such a database

and to clearly define “who may have access to the data,” as underscored by A#5 from the Institute of Public Health. B#2 from the Farmers’ Union agreed that a specific set of rules or legislation is necessary to properly define and specify which organization collects, processes, and shares the information.

The quality of the data sources and their accessibility were also highlighted as necessary topics in forming such a register. A#5 also reminded that Slovenia already had a functioning household register until two or three years ago in which it was possible to see which household a person belonged to; unfortunately, the Ministry of the Interior abolished this register to remove bureaucratic obstacles.

Further discussion pointed out that some of the data in the existing databases, which are linked from different databases, are already of questionable value and could lead to misleading results and generalizations. Therefore, some research participants were reluctant to establish such a registry either because of the possible negative consequences for farmers being exposed to additional scrutiny or because they were unsure about the quality of the data entered, and data generation as farmers usually do not report on sick leave and injuries. B#8 from the Rural Youth believed that farmers would not accept such a control:

If you mention that something will be registered or that certain things will be investigated more closely, farmers immediately see it as a possibility of being subjected to additional control or taxation.

Other debated concerns pertained to the not-yet-determined goals of such a registry by policymakers because these issues have not yet been identified as relevant. The research participants were also concerned about the appropriateness of using existing health databases to analyze the health status of farmers. The database managers hold that a well-designed, targeted, and representative survey or periodic cross-sectional studies might provide a more realistic picture of farmers’ health status than the new registry, which might not solve the problem of under-reported data. The majority of participants from the group of interested professional organizations shared this view and emphasized that representative targeted surveys should also capture some of the information that is not normally found in databases, such as burnout, overwork, negative stress, and increased mental health difficulties.

In sum, the majority of research participants agreed that it would be useful to establish a routine farmer health database that would include everyone working on the farm. Such a registry would be particularly useful in light of the hazardous work farmers do and

the high risks to their health. The research participants also pointed out that the registry could be based on existing data with some additions: inclusion of data on all people working on a farm, including the type of agricultural production, and inclusion of research data related to farmworker health. It was also pointed out that for interested public and noncommercial users, access to routine registry data should be free, while an additional fee should be charged for commercial use and for additional work needed to prepare and process the data. However, some research participants also expressed concerns about the establishment of such a routine registry. The main concern they expressed was the quality of data in existing databases, which could lead to misleading results and generalizations. In addition, farmers might perceive such a register as additional control of their work or additional taxation.

International comparability of farmer health data

Research participants from the group of database managers (Group A) said that those responsible for the health databases managed by the Institute of Public Health and the Health Insurance are not experienced in sharing farmer occupational data with other countries because there was no request for sharing such data. Health database administrators regularly provide data only on accidents and sick leave for different sectors of the economy as part of international data exchange. In this context, data are also exchanged on farmers who belong to the economic sector (Category A) at the administrative level, which includes occupations in agriculture, hunting, forestry, and fisheries.

In Slovenia, almost every person (98.7% on January 1, 2023) is insured through compulsory health insurance. The research participants uniformly assessed access to health data on services within the public health network as very good, while data on self-pay services in the private health sector, in their opinion, are not available in the national health databases. Access to the health data is provided through the health card number. In this view, the research participants believe that Slovenia is one of the countries with good accessible health data, even a “good example” as mentioned by research participant A#2 from the Health Insurance:

Slovenia was cited as a good example at the Statistics Days because we only have one health insurance company, and everyone has one health card and one health number. This can be a problem in other countries because they do not have insight into the type of services that patients use. They have multiple insurances, so it is not possible to link data.

The least problems with data adequacy and transferability were encountered in the transmission of occupational injury data as reported by research participants. Slovenia provides these data to Eurostat and the International Labor Organization (ILO) at the gender, age, and region levels. The Slovenian data meet these criteria as the research participant A#1 from the Institute of Public Health explained:

We have a standardized European methodology for occupational accidents with predefined rules. We submit data for different economic sectors to Eurostat and the International Labor Organization by first, forwarding them to our national Statistical Office, which finally processes them and sends the completed questionnaire to the International Labor Organization.

However, there are several problems with international data exchange related to sick leave and occupational diseases. Representatives from database managers agreed that most countries do not have harmonized national databases that meet OECD requirements because each country has its own specificities, or the data do not reflect the actual situation because occupational diseases are confirmed by special procedures, as research participant A#1 from the Institute of Public Health stated, using the example of the Swedish case:

The Swedes have a similar regulation for occupational diseases as we do. They have the right to self-report diseases in a special system, but very few self-reported occupational diseases are subsequently confirmed by the Social Insurance Agency. ... The situation is similar in Slovenia, where the Slovenian Institute for Pension and Disability Insurance decides whether a certain health condition was caused by work-related circumstances.

Despite occasional calls for database harmonization, this remains a major challenge, because sick leave and occupational diseases are handled differently in different countries. A#1 from the Institute of Public Health continued with an explanation:

Practically every few years, there is an initiative to harmonize this area. And then that voice quickly falls silent because there are major differences in the various health and social systems, such as, when the first day of sick leave must be reported, or what the maximum length of sick leave is. ... Sick leave has not yet been recorded in the different occupations or sectors of the economy. As a result, national data are not comparable, and attempts to harmonize databases are quickly abandoned.

A#1 further highlighted the new platform being developed under the auspices of the EU Commission, which in the future could improve the collection and mutual comparability of national health data:

This might be the possibility for international comparisons through standardized surveys on work environment and health under the auspices of the European Union Information Agency for Occupational Safety and Health and Eurofound.

Some participants from the interested professional organizations (Group B) believed that there is an interest in international data exchange on farmers' health status, but they also noted that in other countries, there is a problem with the availability of such statistical data at the national level and their qualitative usability and reliability. B#4 from the Chamber of Agriculture said:

It's hard to say how our data compares internationally. But I do know one thing: other countries have similar problems. Or even bigger ones. In some countries, it goes so far that they already have national campaigns in certain areas. For example, because of the high suicide rate in agriculture, there are campaigns to prevent this.

B#2 from the Farmers' Union said that he followed information about farmers' health and foreign practices through social networks, the Internet, and the media and noticed that "in Western countries, there is a lot of writing and talking about this topic in agricultural circles." B#8 from ZPMS referred even to direct contact with other countries, where they tried to obtain data on farmers' health, information on promotion and prevention programs, and measuring their impact. In this context, B#5 from ZPMS referred to the examples of good practices in health care for farmers in Austria and France. She stressed that it was particularly difficult to evaluate the impact of preventive measures in the field of mental health on the basis of health statistics alone. Therefore, databases are not very helpful as well as from the point of view of the international exchange of health data:

Austria is certainly a good example, where psychosocial assistance to farmers was introduced years ago and attempts are being made to monitor the effects of the assistance, including with statistical data. However, it is very difficult to evaluate this assistance in terms of efficiency and utilization of health services. It is not like a hand injury; when it heals, it is over. ... In France, they are now at a similar stage as we are. They have done a survey on mental health issues which was triggered by a documentary about suicides in agriculture. Now there is a co-

ordinator who deals with mental health problems on farms. He coordinates the work of the Ministry of Agriculture, the Ministry of Labor, and the Ministry of Health. Civil society, including postal workers, is also heavily involved in prevention.

The focus discussion on the comparability of farmer health data showed that the research participants from the group of database managers do not have experience with sharing farmer health data with other countries, mainly because there has not been a request for sharing such data. Nevertheless, data on accidents and sick leave for various sectors of the economy have regularly been sent to Eurostat and the International Labor Organization as part of international data exchange. This data exchange also includes farmers who are recorded within the economic sector (Category A), which includes occupations in agriculture, hunting, forestry, and fisheries. The research participants from the database administrators group agreed that there are several problems with data exchange at the international level because most countries do not have harmonized national databases that meet, for example, OECD requirements, as each country has its own unique characteristics. Efforts to harmonize international databases have been underway for a long time, but have been unsuccessful. The research participants from the interested professional organizations reported that they are interested in international comparisons of farmer health data, although there are concerns about the usefulness of statistical data on health in some of their areas of activity (e.g., health promotion, prevention programs). This information is mainly obtained by monitoring information on farmers' health and foreign practices on social networks, the internet, and in the media.

Discussion

The focus group results provided several insights, the first being that the existing health database does not cover all farmers in the category of employees in agriculture, hunting, forestry, and fishing. This indicates that the decision-makers, designers and developers of these databases are not sufficiently aware that 99% of agricultural units in Slovenia are family farms (SORS, 2023), which special working units with a specific organization and work culture (Brandth & Haugen, 2007; Calus & Van Huylenbroeck, 2010; De Haan, 1993; Gasson & Errington, 1993; Loyns & Kraut, 1992; Small 2005). All farm family members with different insurance and age or gender characteristics contribute to agricultural production to a greater or lesser extent based on a particular work ethic that binds family members through an implicit contract (Gasson, 1979; Gasson et al., 1988; Netting, 1998; Nye, 2018). This means that each member of the family farm is expected

to do the work on the farm, or even to take over the work of the other sick or injured member when necessary. For this reason, members of family farms cannot be excluded from the farm labor force and treated in the same way in the health database as employees in other businesses who work on the basis of a different work organization and culture. These specifics of family farming, also confirmed in the FS discussion, suggest that a different approach to the design of the health database is needed and that the same approach should not be used for the definition of observation units and data collection as for other non-agricultural business units. The current framework and methods of data collection result in insufficient coverage and representativeness of all farmers and farm workers (who are mostly family members). Therefore, the existing health database does not allow for adequate monitoring of the health status of the farming population and the design of appropriate measures to improve their health and safety, which, as shown by a number of studies (Chiswell, 2023; Demos et al., 2013; Diomidous et al., 2009; Garzia et al., 2018; Jones et al., 2009), presents a problematic picture.

The focus group discussion also suggests that those who have a different status (off-farm labor), but regularly work on the farm in their free time, are not included in the category of the farming population in the health database and, consequently, are not supposed to be included in the health surveillance and preventive care. Studies have shown that off-farm work and the combination of on-farm and off-farm work are considered an efficient allocation of household labor resources, and that off-farm work is considered an important supplement to farm income (Corsi & Salvini, 2012; Khanal & Mishra, 2014; Ma, 2023). However, their health status in the context of sharing farming and work in other sectors is not yet well documented; existing studies provide mixed results conveying either a positive correlation between a person's health status and their off-farm employment or a negative correlation on the issue (Guangli & Chunjin, 2011; Haugen & Blekesaune, 2005; Shen et al., 2022).

The vast majority of farm family members in Slovenia are employed in other sectors, and although they are covered by social and health insurance, the costs to their well-being and health resulting from the double burden and heavy physical and stressful farm work are not clearly captured. This is reflected to some extent in occupational injury statistics, which, while underestimated, indicate that the number and proportion of occupational injuries are increasing among this group of workers, specifically part-time farmers (Černič Istenič et al., 2022). However, existing health statistics for the farm population do not include data on the costs incurred in on-farm work-related illnesses and injuries.

In addition to the lack of high quality and reliable statistics on the health status of farmers (only socially insured farmers are monitored), the focus group discussion highlighted the precarious situation of many people involved in farm work, especially young, older people, and women farmers who are not socially insured. Slovenian governments have failed to address the basic preventive and curative health needs of those who work in agriculture and are socially insured from farming. Legal frameworks, such as ILO Convention C184 on Safety and Health in Agriculture of 2001, expect countries to ensure decent working conditions for all workers in agriculture, but thus far, only 18 countries have ratified this convention, including six European countries, of which Slovenia is not one. Council Directive 89/391/EEC (1989), requires all employers in the EU and associated countries to regularly assess and document risks and inform workers of procedures to prevent occupational accidents and diseases. This legal framework, which requires a mandatory occupational health service, an occupational safety and health training program, and replacement work assistance in case of absence from work due to illness or injury for self-employed farmers and farm workers, is implemented differently across Europe. Slovenia belongs to the group of countries that do not have any of these benefits (Jakob et al., 2021). The lack of health records seems to be related to this lack of preventive care.

The focus group discussion shows that part of the reason for the incomplete health statistics can be attributed to farmers themselves. Several studies have already pointed out that farmers with (mental) health difficulties rarely seek professional help (Hagen et al., 2021; Roy & Knežević Hočevár, 2019; Younker & Radanovich, 2021), also due to their agrarian ethics emphasizing autonomy, independence, resilience, and self-reliance (Heenan, 2000a, 2000b; Johansson, 1991; Lovelock, 2012; Melberg, 2005; Shortall et al., 2018). The under-reporting of occupational injuries by farmers themselves, as pointed out by the focus group research participants, is another challenge in the existing system that needs to be addressed and overcome in the improvement of quality health statistics.

The process of creating a particular database of farm health statistics requires a broad discussion between all stakeholders (from policymakers and professional associations to researchers and farmers and farm workers themselves) and not only international organizations concerned with health and safety in agriculture, was also made clear by several topics addressed.

The research participants agreed about the establishment of a special register for farmers' health data, which would not only collect data on farmers' health but also on all persons working on the farm, and that special surveys would be useful in this regard. A

registry is supposed to enable the ongoing monitoring of health trends among workers, support the early detection of emerging health problems and the implementation of timely interventions, prevent the spread of diseases and mitigate potential health crises, and promote the development of targeted health and safety measures in the workplace (Meglič et al., 2013; Pop et al., 2019; Thygesen & Ersbøll, 2014).

However, the research participants also expressed the fear that farmers might perceive the establishment of such a register as additional control over them. This raises another question of how farmers might benefit from such a specialized health registry and to what extent all other stakeholders involved are committed.

The concerns expressed by the focus group participants relate, in particular, to the quality of the data in the existing databases. The recent review of data quality of the health databases in Slovenia as part of the European research project Research on Psychiatric Hospitalization by Record Linkage of Large Administrative Data Sets (CEPHOS, Finnish Institute for Health and Welfare, 2023) shows that the Slovenian health databases indeed have certain shortcomings, such as incorrect or incomplete records of diagnoses, prescriptions, services and care providers, as well as incomplete recording of comorbidities, but other researchers pointed out similar shortcomings of health registries elsewhere (Strongman et al., 2019). Despite the benefits of health registries, there are also pitfalls and limitations that need to be considered when using data from medical registries. The field of data science is a promising area for the healthcare industry, which hopes to create a more efficient healthcare system. Recently, healthcare researchers have highlighted the potential and detrimental effects of healthcare registries on patient care, linking them to increased medical costs, patient mortality and poor decisions by clinicians and healthcare decision-makers, privacy concerns, as well as data quality and interoperability (Pop et al., 2019; Rubinger et al., 2023). In addition, the health policy experts who participated in the focus group emphasized that the Slovenian healthcare system is digitally incoherent and fragmented (only recently did the Slovenian government start to prepare the law on the digitization of healthcare) and that large amounts of fragmented data are collected, which are often of no use to medical staff or patients, and they cannot even be used for research purposes.

The question of who and what information is included in large health databases is not specific to Slovenia, as this is a general challenge for researchers using big data in population health and occupational health (Descatha & Fadel, 2023; Dini et al., 2019; Wang et al., 2023), raising the question of the representativeness of the data (Thygesen & Ersbøll, 2019). In this context, the focus group research participants noted that they currently ob-

tain international farmer health data from a variety of sources, including social networks, the Internet, and media channels. This approach highlights the reliance on indirect sources of information and points to a potential gap in the availability or accessibility of comprehensive and standardized international databases. These gaps in international health data exchange have recently been addressed in the EU through the European Health Data Space (Cyber Risk, n.d.), and globally through the Global Health Data Exchange (GHDx) platform (Institute for Health Metrics and Evaluation, 2023). The aim is to provide a central repository of health-related data from a variety of sources, enabling researchers, policymakers, and the public to access and analyze information on a range of health metrics and indicators. However, to fully realize the potential of health data platforms, challenges, such as privacy concerns, interoperability, and security risks still need to be addressed (de Mello et al., 2022; Lee et al., 2021; Shrivastava et al., 2021).

Conclusions

Several reports and studies agree that monitoring the health statistics of people who farm is crucial to ensure their well-being, improve workplace safety, and provide information for policies and interventions that address the specific health challenges associated with agricultural work. In practice, however, access and availability of occupational health and other health-related databases and surveys about people who farm is very limited. In Slovenia, there is still no representative survey that could confirm the various observations and assumptions of researchers and professionals about the health status of farmers and its impact on their work and daily functioning. There is also a lack of reliable statistics on the health status of people who farm, as the existing data is limited only to those who are covered by social insurance. Therefore, the existing datasets containing the category/sector agriculture and hunting, forestry, and fishing do not cover all people working on farms and are not cross-checked with other datasets. This suggests that the data on accidents at work and seeking leave of people who farm are significantly underestimated.

One of the biggest obstacles to obtaining reliable health data from Slovenian national health registers is the elusive definition of an “active farmer.” All persons working in agriculture should be included, regardless of their gender, whether they work part-time or full-time, whether they are covered by social security or not, and whether they derive a significant part of their income from agriculture. However, in this regard, changes in the legal basis (solving the data protection issue) and even more technical solutions are necessary.

Researchers, journalists, policymakers, and professional organizations are interested in farmers' health data. However, access to this data is sometimes linked to the inexperience of applicants and the complex approval process. Despite expressed interest in the establishment of a farmer health database covering all persons working on the farm, there are some concerns about this effort. The quality of the data, the potential attitude of farmers towards such a register, and the delicate balance between access to the public interest and ensuring fair treatment for commercial use need to be carefully considered.

Although the area of health data sharing and international comparison of selected health indicators is of interest to policymakers and representatives of professional organizations, Slovenian database administrators pointed out that they have no experience with international sharing of health data originating exclusively from people who farm, mainly because no request for sharing such data has been made. There are several barriers to sharing health data internationally, such as privacy and security concerns, diverse data standards, lack of interoperability, data governance and ownership, and infrastructure and technology gaps. Efforts to overcome these barriers often include international collaboration, the development of standardized protocols, and the establishment of frameworks that address the legal, ethical, and technical challenges associated with the global exchange of health data.

Declaration of conflicting interest

The Authors declare no conflict of interest.

Funding

This article is part of the ongoing basic research project Changes in Agriculture Through the Farmers' Eyes and Bodies (J6-2577) and research program Studies on Distress and Being Well (P5-0439), funded by the Slovenian Research and Innovation Agency (ARIS). The authors greatly appreciate the time and willingness of all research participants who made this research possible.

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Povzetek

Statistični podatki z vsega sveta kažejo, da je kmetijstvo eno izmed najbolj tveganih delovnih okolij z vidika varnosti in zdravja pri delu. V Sloveniji so statistični podatki o zdravju ljudi, ki kmetujejo, slabe kakovosti; na voljo so le podatki o nezgodah pri delu, pa še ti so podcenjeni. Članek obravnava potrebo po zanesljivih zdravstvenih statistikah o kmetih in kmetijskih delavcih v Sloveniji ter ovire in pasti, s katerimi se srečujejo potencialni lastniki podatkov in njihovi uporabniki. V okviru antropološkega raziskovalnega projekta *Spremembe v kmetijstvu skozi oči in telesa kmetov* ta študija presoja gradivo, pridobljeno v treh fokusnih skupinah z lastniki nacionalnih zbirk podatkov o zdravju in z zdravjem povezanih dejavnikov ter drugimi predstavniki različnih vladnih in nevladnih kmetijskih organizacij. Rezultati kažejo, da udeležence raziskave zanimajo zdravstveni statistični podatki o ljudeh, ki kmetujejo. Vendar pa obsežneje spregovorijo o dejavnikih in okoliščinah, ki jih je nujno upoštevat, da se zagotovi kakovost zbiranja podatkov, in koristi, ki jih takšni podatki prinašajo samim kmetom in delavcem na kmetijah.

KLJUČNE BESEDE: longitudinalna kvalitativna metodologija, etnografska imaginacija, nacionalni raziskovalni načrt, nacionalno mešani pari, migracije

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