



Death of a resident due to a hazardous substance in a nursing home in South Savo in November 2022



T2022-02

FOREWORD

Pursuant to Section 2(2) of the Safety Investigation Act (525/2011), the Safety Investigation Authority decided to investigate an incident that occurred on 26 November 2022 at a private service housing unit in South Savo in which a hazardous substance caused the death of an elderly resident.

The purpose of the safety investigation is to increase general safety, and to prevent accidents, hazardous situations and resulting damage. Safety investigations are not conducted to assign legal liability.

Jaakko Niskala was appointed as the head of the investigation team consisting of client and patient safety specialist Riitta Flinck, safety investigation specialist Ilpo Valta and specialist of work and organisation practices Sari Yli-Kauhaluoma as members. Chief Safety Investigator Hanna Tiirinki served as the chief investigator.

The safety investigation determines the course of events, the causes and consequences, the rescue measures and the activities of authorities. A particular focus of the investigation is to find out whether or not safety was sufficiently taken into account in the activities that led to the accident or the design, manufacture, construction and use of the devices and structures that caused or were involved in the accident or hazard. In addition to this, the appropriate organisation and handling of management, control and inspection activities is analysed. If necessary, any deficiencies in regulations and provisions regarding safety and authorities must be determined.

The investigation report describes the course of the accident, the factors that led to the accident, the repercussions of the accident and the safety measures recommended to the appropriate authorities and other parties to improve general safety; prevent future accidents, hazardous situations and damage; and increase the efficiency of the activities of rescue and other authorities.

The persons involved in the accident and the authorities responsible for supervision in the field of the accident have been provided with the opportunity to issue a statement on a draft of the investigation report. The statements have been taken into account in finalising the investigation report. A summary of the statements is included at the end of the investigation report. Pursuant to the Safety Investigation Act, the statements provided by private persons are not published.

The investigation report was translated into English by Grano Language Services.

The investigation report and a summary of it were published on the website of the Safety Investigation Authority at www.turvallisuustutkinta.fi on 27 June 2023.

TABLE OF CONTENTS

FOREWORD	2
1 EVENTS.....	5
1.1 Course of events	5
1.2 Emergency reports and rescue measures.....	6
1.3 Repercussions.....	6
2 BACKGROUND INFORMATION	7
2.1 Operating environment, equipment and systems.....	7
2.1.1 Nursing Home Attendo Mäntyhovi	7
2.1.2 Consumer chemicals involved	9
2.2 Circumstances.....	10
2.3 Recordings.....	10
2.4 Persons, organisations and safety management in relation to the accident	10
2.4.1 Persons involved	10
2.4.2 Attendo Mäntyhovi's preventative activities	11
2.4.3 Service provider's safety management	12
2.5 Preventive measures by authorities	12
2.6 Organisations involved in the rescue measures and their operational readiness	13
2.7 Provisions, regulations and instructions.....	14
2.8 Other accounts	14
2.8.1 Client safety in the context of social welfare services for the elderly	14
2.8.2 Poisoning of elderly persons	15
2.8.3 Account of accidents among elderly people	15
2.8.4 Poison Information Centre.....	15
2.8.5 Guide for treating poisoning.....	16
2.8.6 The Safely at All Ages programme	16
2.8.7 National client and patient safety strategy 2022–2026.....	16
3 ANALYSIS.....	17
3.1 Analysis of the incident	17
3.1.1 Clogging of the drains.....	17
3.1.2 Storage of chemicals	18
3.1.3 Night at the nursing home	18
3.1.4 Ingesting drain cleaner granules	18
3.1.5 Poisoning.....	19
3.2 Analysis of the actions of the authorities	19
4 CONCLUSIONS	20

5	SAFETY RECOMMENDATIONS.....	21
5.1	Development of a self-monitoring plan	21
5.2	Learning from incidents in the social and health care sector.....	21
5.3	Implemented measures.....	22
	SOURCES.....	23
	SUMMARY OF THE STATEMENTS IN THE DRAFT INVESTIGATION REPORT	24

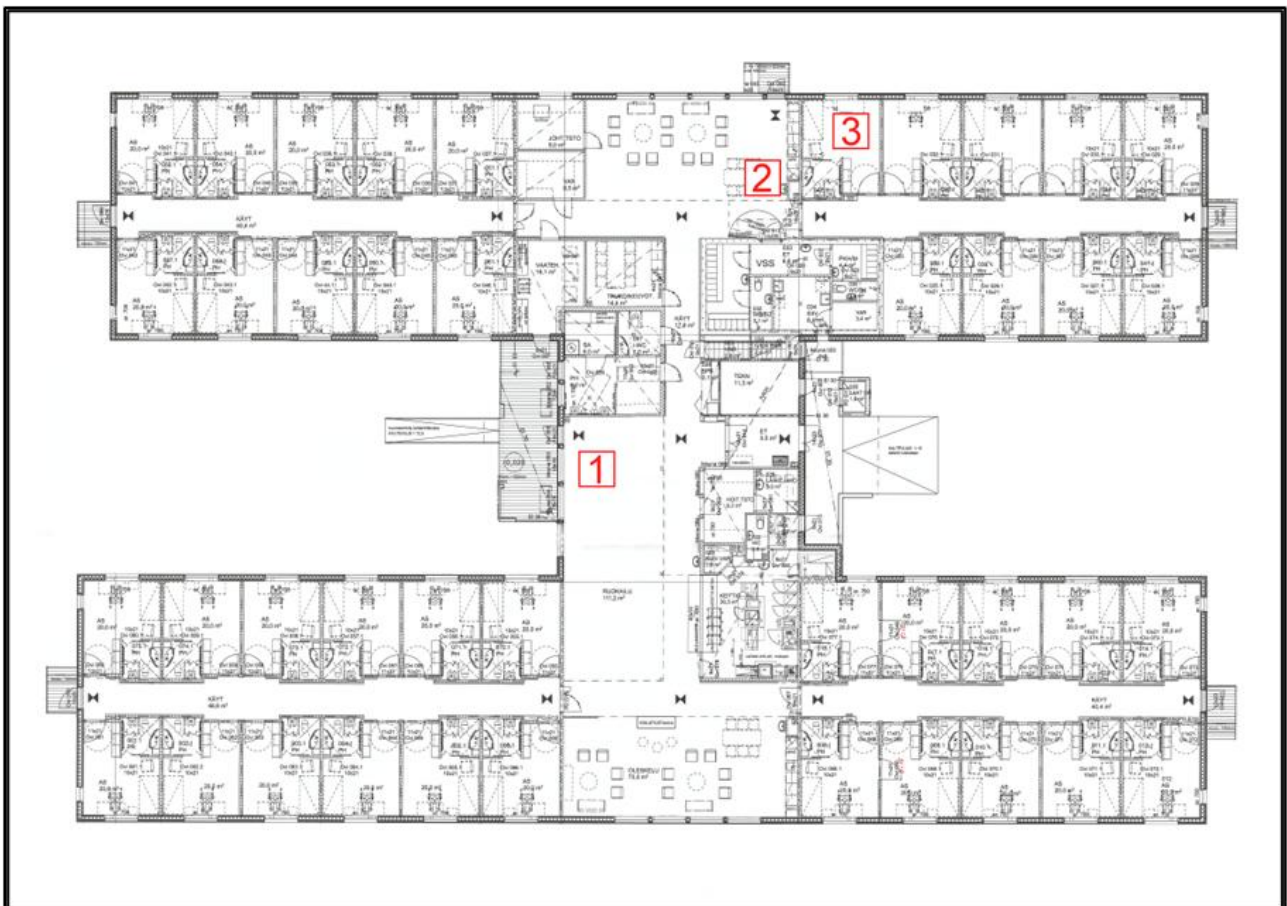
1 EVENTS

1.1 Course of events

The accident took place in South Savo at the nursing home Attendo Mäntyhovi in Mäntyharju early in the morning of Saturday 26 November 2022.

An elderly resident slept in an armchair in his own room for the initial portion of the night. At about 5 am, he came to the practical nurse who was serving as the night nurse and was sitting in the main lobby recording the events of the night. The nurse had not heard that the resident had visited the auxiliary kitchen. The nurse asked if the resident needed any assistance, at which point he spat on the floor. The nurse asked the resident to go to his room and said she would follow. On the way to the room, there was spit on the floor every 4–5 metres. At this point, the nurse saw containers of washing up liquid and drain cleaner granules on the table of the auxiliary kitchen. There were also two mugs on the table. One had foam in it while the other had some liquid at the bottom. At about 5:05 am, the nurse entered the resident's room at which point he indicated being thirsty and feeling a burning in his throat. The resident said that he had consumed a small amount of both of the substances.

At 5:15 am, the nurse called the Poison Information Centre and asked for instructions. After this, she called the emergency response centre.



Picture 1. The following have been marked on the layout drawing of the nursing home: 1) Desk of the practical nurse who served as the night nurse 2) Auxiliary kitchen 3) Resident's room. (Image: Mäntyharju building control)

1.2 Emergency reports and rescue measures

The emergency response centre received the emergency call regarding the incident at 5:24 am. Based on the call, a resident of the nursing home had consumed some washing up liquid and drain cleaner granules. According to the resident, he had spat out the substances immediately but he felt some burning in his throat.

At 5:29 am, the emergency response centre requested an ambulance from Mäntyharju fire station under the *code 752C*, i.e. poisoning, non-urgent assignment. The ambulance departed at 5:31 am and arrived at Attendo Mäntyhovi at 5:32 am. The transport of the patient to Mikkeli Central Hospital began at 5:42 am. The family were initially informed of the incident by the doctor at the hospital.

On Tuesday 29 November, Attendo Mäntyhovi was notified that the resident had died. Immediately after this, the manager requested that occupational health care organise a debriefing event for the staff. On Friday 2 December, occupational health care arranged a voluntary debriefing session for the staff. Five people took part.

1.3 Repercussions

A 94-year-old male resident of the nursing home died due to exposure to alkaline substances (washing up liquid and drain cleaner granules) on 28 November 2022.

2 BACKGROUND INFORMATION

2.1 Operating environment, equipment and systems

2.1.1 Nursing Home Attendo Mäntyhovi

Attendo Mäntyhovi is a private service housing unit for the elderly. It provides elderly people with service housing¹ and intensified service housing services. Service housing means housing and other services, such as meal, clothing, washing and cleaning services, that are organised at a service housing unit. Intensified service housing residents have a 24-hour need for treatment and care. The nursing home has room for a total of 41 residents.

Attendo Mäntyhovi submitted a permit application with the Regional State Administrative Agency for 24-hour housing services, pursuant to the preliminary supervision practices, before commencing the operations. The nursing home and its final review were completed in 2017. The nursing home operations began in the same year. The building has one floor with offices, a kitchen and two lounge areas in the middle, including a auxiliary kitchen with the relevant equipment. Four corridors start from the lounge area. The residents' rooms with private bathrooms are located along them.

The incident took place in the auxiliary kitchen in the north wing. The equipment and fixtures included conventional household appliances, a sink and lockable storage cabinets and drawers. The kitchen doors and cabinets/drawers featured locks, which did not engage automatically upon closing. The locks were keyed to open with the staff keys. Only the residents' own alcoholic drinks were kept in the locked cabinets.

¹ As a result of an amendment to the Social Welfare Act, intensified service housing has been referred to as 24-hour service housing since 2023.



Picture 2. North wing auxiliary kitchen. (Photo: OTKES)

The auxiliary kitchen was only used by the staff. On weekdays, the main kitchen was also used to prepare the residents' meals for the weekend. The staff brought the meals from the main kitchen to the auxiliary kitchen, where they were heated. Foodstuffs for evening snacks were also brought to the refrigerator in the auxiliary kitchen.

The kitchen staff were responsible for the cleanliness and cleaning of the main kitchen. The care staff were responsible for the cleanliness of the auxiliary kitchen and serving areas. The cookware was washed in the main kitchen, but all other dishes used for meals were washed in the auxiliary kitchen.

The property management of Mäntyhovi was handled by a local company, which visited six times in 2021–2022 to clear the drain. One of these was related to the sink drain in the auxiliary kitchen. Despite this, the drains kept getting clogged. For this reason, Attendo Mäntyhovi purchased drain cleaning granules some years ago. The granules and dish washing liquid had been kept in an unlocked sink cabinet in both of the auxiliary kitchens for a long time. The same cabinet was also used to keep biowaste bags, which were also needed on a daily basis. The staff used the drain cleaning granules regularly. Drain cleaning granules were also available to the facility maintenance staff in a locked cleaning cupboard.



Picture 3. The sink cabinet was also used to store drain cleaning granules. The lock model is also shown in the photo. (Photo: OTKES)

2.1.2 Consumer chemicals involved

The chemicals used were both intended for consumer use. Of these, the Nord Clean drain cleaning granules are designated as a hazardous substance that is corrosive and intended for clearing clogged pipes. The drain cleaner granules contain sodium hydroxide (lye). The contents of the package are solid, granular and odourless. The granule package was ²compliant with regulations. For example, it contained the warning label GHS05 *Corrosive* and the indicator *Hazard*. The product has the following hazard statements: H290 May be corrosive to metals; H314 Causes severe skin burns and eye damage. Furthermore, the package featured a child-resistant cap, which required simultaneous pressing and twisting to open. The label provides instructions for situations in which the chemical has been ingested or come into skin or eye contact. Care facilities are only permitted to store amounts of chemicals that are required for conducting their activities.³

² The CLP Regulation, i.e. Regulation of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures 1278/2008 and Article 35 of the Regulation.

³ Government Decree on the Monitoring the Handling and Storage of Dangerous Chemicals 685/2015.



Picture 4. Nord Clean container of drain cleaner granules. The package includes warnings and a safety cap. Pictured on the right is what the practical nurse found on the night of the incident. (Images: OTKES and Attendo)

The Sun Professional washing up liquid is a bright green liquid for washing dishes. It contains 2-phenoxyethanol, which is highly irritant to the eyes. The package include the warning labels *Health hazard* and the indicator *Warning*.

2.2 Circumstances

The incident took place early in the morning. Due to the number of care workers assigned, Attendo Mäntyhovi only had 21 residents at the time of the incident, the majority of whom had memory disorders and, therefore, required intensified housing services. As planned, there was one practical nurse on the night shift. In addition to making the normal rounds, she remained on call in the main lobby in the middle of the building. From this position, she could not hear what was going on in each corridor or the auxiliary kitchen where the accident took place. The lighting in the corridor and auxiliary kitchen of the nursing home was normal.

2.3 Recordings

The emergency response centre's recordings of the incident were available to the investigation team. They indicated the content and time of the emergency calls, and the way in which the first aid unit was alerted. In addition to this, the recordings indicated the departure time of the ambulance and the time of its arrival at the nursing home.

The emergency response centre's recordings of the incident were also available to the investigation team. They clarified the time and content of the calls.

2.4 Persons, organisations and safety management in relation to the accident

2.4.1 Persons involved

The resident concerned was a 94-year-old man who normally used a walker to get around. His vision and the strength in his muscles and fingers were weakened. He liked to drink bottled mineral water to quench his thirst.

The night nurse of Attendo Mäntyhovi was a practical nurse with a licence to dispense medication. She had about five years of experience in working at the nursing home.

The turnover of nursing home staff had been high. At the time of the incident, the nursing home had had several managers. The person most recently responsible for the nursing home – the manager of Attendo Mäntyhovi – assumed the post in September 2022.

2.4.2 Attendo Mäntyhovi's preventative activities

Self-monitoring⁴ refers to the service producer's own quality and client safety assurance work. The self-monitoring is based on risk management conducted at the unit. The aim is to prevent the realisation of risks and react to observed critical work phases or development needs in a systematic and fast manner. The requirements agreed upon in the procurement contract are included in the matters covered by the self-monitoring.

The most important tool for self-monitoring is the self-monitoring plan⁵, which is a public document. The purpose is to indicate how the unit ensures that the services are provided with a sufficient level of quality and client safety. The staff must continuously assess their activities in matters related to client safety, for example. Every employee of the unit is obliged to present any disparities, quality deviations and risks that they observe.

Each unit must update the self-monitoring plan under the leadership of the appropriate supervisor at least once a year or as needed according to changes. Attendo Mäntyhovi's self-monitoring plan⁶ was updated twice in 2022. The self-monitoring plan was available on the noticeboard of Attendo Mäntyhovi's entrance hallway and on the website, but there was variation in the staff's awareness of it and its content. The self-monitoring plan did not mention the storage of consumer chemicals. According to the manager, however, the staff had been separately verbally instructed to keep chemicals in locked spaces in the laundry room and cleaning room.

In addition to the self-monitoring plan, operational risks are assessed in the evacuation safety report; rescue plan; self-monitoring plan pursuant to the Food Act; drug treatment plan; and the service process, occupational safety and occupational health risk analyses, for example.

For **quality management**, the unit utilises the Attendo Add Systems solution for recording safety deviations. The system is used to monitor the number of deviations regularly and react to them. The deviations are covered regularly in unit meetings, occupational safety meetings and management reviews, and the sufficiency of the corrective measures is assessed. Serious incidents are reported to the service provider. In addition to this, the operations of the nursing home are guided by Attendo's quality system and group-level instructions on development needs and targets. An internal audit of the unit was conducted in 2020, and a drug treatment audit was carried out in May 2022. The risk caused by consumer chemicals was not taken into account.

The rescue plan⁷ is a document with which the operator indicates its knowledge of the building and the risk factors related to the operating environment. The rescue plan must describe all possible hazardous situations related to the building and the activities within it as well as the means for preventing these situations. The Mäntyhovi rescue plan⁸ did not include mention of the storage of consumer chemicals.

⁴ Act on Private Social Services 922/2011

⁵ National Supervisory Authority for Welfare and Health (Valvira): Regulation concerning the content, creation and monitoring of self-monitoring plans for private social services and public services for the elderly (2014).

⁶ Latest update to the self-monitoring plan 15 November 2022

⁷ Rescue Act 379/2011, Government Decree on Rescue Services 407/2011.

⁸ Updated 24 October 2022

As regards **induction practices**, Attendo's instructions indicate that new employees are oriented to their tasks in a diverse manner through online learning environments and practical induction tasks. For the purpose of providing induction to substitutes, the unit utilises the induction card for care and service home substitutes. According to the card, the induction covers the following, for example: the obligation of secrecy and non-disclosure, weekly programme, records, drug treatment, unit-specific hygiene instructions, actions in emergencies and acute situations, job descriptions and responsibilities at the unit. The induction materials do not cover consumer chemicals.

According to **Attendo's cleaning service manual**, cleaning agents must always be stored in a locked space. The cleaning instructions are provided on cards with pictures. In addition to the cleaning instructions, Attendo has prepared a product list of the cleaning agents to be used. The Sun Professional washing up liquid and its product description are included in the product list.

2.4.3 Service provider's safety management

The South Savo Social and Health Care Authority (Essote) had about 30 housing service units for the elderly, half of which were units providing outsourced services, such as Attendo Mäntyhovi. At the time, the housing services for the elderly had room for just over 400 residents. The monitoring of the units was based on monitoring plans.

Essote prepared a self-monitoring plan in February 2022 and updated it on 1 April 2022. According to the 2022 monitoring plan for Essote services, the systematic monitoring of all disability services and housing units for the elderly covered the following activities, for example:

- preparing and updating the drug treatment plan
- performing the self-monitoring and updating the self-monitoring plan in a timely manner

In recent years, the monitoring of the housing service units has been mainly reactive and focused on deviations. Deviations can be reported by the residents' family members or the staff. Attendo Mäntyhovi's staff had contacted Essote numerous times, because the manager of the unit had changed at an abnormally high frequency.

Essote conducted a control, monitoring and inspection visit to Attendo Mäntyhovi between 7 February and 22 April 2022 in the form of documentary control. A specific focus was the fulfilment of the statutory staff allocation and direct work with clients. The number of employees had been insufficient on 20 days. There had been problems with the atmosphere of the unit for a long time. This impacted recruitment and occupational well-being. Essote obliged the person responsible for the unit to ensure and pay attention to the issues specified in the monitoring report and to report on them. It was also indicated that the monitoring did not cover all of the unit's activities or premises and that there may still be unaddressed deficiencies. The report did not cover the storage of consumer chemicals.

Essote's monitoring coordinator was informed of the deviations at Attendo Mäntyhovi electronically. Severe deviations must be reported within 1–5 days. In 2022, a total of three deviations were reported regarding Attendo Mäntyhovi, two of which were related to drug safety and one was related to other treatment monitoring.

2.5 Preventive measures by authorities

The National Supervisory Authority for Welfare and Health (Valvira) is a national permit and supervisory authority for social welfare and health care. Valvira guides the activities of

Regional State Administrative Agencies in the execution, coordination and harmonisation of monitoring activities and related steering. Valvira does not guide the activities of Regional State Administrative Agencies in ways other than those described above. Generally speaking, it is Valvira's task to ensure that social welfare and health care services are appropriate. The monitoring and steering activities are related to the quality and lawfulness of the services, which also includes client and patient safety. Valvira also handles supervision and permit management for social welfare and health care as well as the related guidance of the organisers and producers of social welfare and health care services. Valvira also monitors social welfare and health care operating units.

The Regional State Administrative Agency for Eastern Finland (AVI) also operates as supervisory authority for social welfare and health care. Units must apply for a permit from the Regional State Administrative Agency for the provision of 24-hour housing services. When a service provider operates in the area of more than one Regional State Administrative Agency, the permit application must be submitted to Valvira. In addition to initiating the operations of a new housing unit, a permit is needed when there are changes to the service production or persons in charge of an operating unit.

The municipality where the unit is located conducts the inspection visit required for granting the permit and issues a statement to the Regional State Administrative Agency, which maintains a register of housing service providers.

Valvira and the Regional State Administrative Agency plan a monitoring programme for the operating units together. The aim is to support and develop the self-monitoring of the units. The monitoring programme features focuses that change on an annual basis. The primary operator in the reactive monitoring of social welfare and health care services is the Regional State Administrative Agency of the area.

The Regional State Administrative Agency for Eastern Finland has processed four monitoring matters related to Attendo Mäntyhovi:

- Inspection request to Essote in February 2020 based on a complaint regarding Attendo Mäntyhovi. The complaint concerned the pain relief of patients in palliative care.
- Supervisory case opened on 18 March 2022 regarding client safety and the allocation of care staff at Attendo Mäntyhovi.
- Complaint on 23 May 2022 regarding the care and treatment of a client at Attendo Mäntyhovi. The Regional State Administrative Agency issued a reprimand to Attendo Mäntyhovi on 25 July 2022.
- Enquiry related to the care staff allocation at Attendo Mäntyhovi on 4 October 2022.

2.6 Organisations involved in the rescue measures and their operational readiness

The Emergency Response Centre Agency provides emergency response centre services in South Savo. Its duty is to receive emergency calls and alert the necessary units based on the instructions provided by the competent authorities.

The South Savo Social and Health Care Authority (Essote) handled emergency care in the area at the time of the incident. In Mäntyharju, the operations had been organised with the rescue department under an agreement. The service level decision on emergency care required patients in the built-up area of Mäntyharju to be reached in no more than 12 minutes in 90% of urgent cases and in 30 minutes in non-urgent cases.

Attendo's occupational health care provision organised emergency social welfare and crisis services for its staff.

2.7 Provisions, regulations and instructions

The Social Welfare Act⁹ lays down provisions on 24-hour service housing at a nursing home, service home or equivalent housing unit where a person is provided with housing according to their needs. The housing unit staff provide immediate care and treatment at all hours of the day.

The Act on Supporting the Functional Capacity of the Older Population and on Social and Health Services for Older Persons¹⁰ includes provisions on ensuring the quality of services organised for elderly people. According to the Act, public service providers are obliged to implement systematic self-monitoring.

The Act on Health Care Professionals¹¹ is intended to promote patient safety and the quality of health care services.

The Act on Social Welfare Professionals¹² is intended to promote patient safety and the right of social welfare clients to receive high-quality social welfare services and be treated well.

The Act on Private Social Welfare Services¹³ obliges the providers of private social welfare services to prepare a self-monitoring plan to ensure appropriate operations.

Valvira's regulation¹⁴ on providers of private social welfare services and public services for the elderly applies to the content, preparation and monitoring of the self-monitoring plan. The responsibility of the service providers regarding the appropriateness of their operations, the quality of the services, and client and patient safety is an important element in the supervision of social welfare and health care services.

The self-monitoring plan must describe how the unit's risk management is implemented and how the information on any quality deviations and hazardous situations observed as a result of the risk assessment is processed and documented.

The Act on the Status and Rights of Social Welfare Clients¹⁵ is applied to social welfare services organised by public and private parties. Social welfare clients and clients of 24-hour service housing are equally entitled to receive high-quality services from the service provider.

2.8 Other accounts

2.8.1 Client safety in the context of social welfare services for the elderly

Studies indicate that the importance of safety increases as people age and begin to have issues with functional capacity due to memory disorders, for example. (Ristolainen et al. 2021.) As such, promoting and ensuring client safety are key goals of social welfare legislation. (Lohiniva-Kerkelä 2022.) Client safety consists of multiple elements, which are legislation,

⁹ 101/2014, Section 21(c)

¹⁰ Act on Supporting the Functional Capacity of the Older Population and on Social and Health Services for Older Persons 980/2012

¹¹ 559/1994

¹² 817/2015

¹³ 922/2022

¹⁴ 25 June 2014

¹⁵ 812/2000

client rights, operator duties and responsibilities, and a system for guiding and supervising the operations.

The safety of elderly services also comes down to ensuring quality and managing the risks of service production. (Valokivi & Hirvonen 2022.) The organisation providing services must be able to ensure client safety in all situations. (Jylhä et al. 2021.)

2.8.2 Poisoning of elderly persons

In Finland, deaths due to poisoning normally take place outside health care, but some patients also die in care. (Goebeler & Kriikku 2022.) Acute poisonings significantly burden the health care services system, and thousands of substances may cause severe poisoning among the population. Conducting a risk assessment on a poisoned patient is often difficult and the initial data available is lacking. (Kratz & Lilius 2022.) The most common groups of substances to cause poisoning are pain medication, sedatives, psychopharmaceuticals, intoxicants, domestic cleaning products, cosmetics and over-the-counter drugs. (Gummin et al. 2009.) Cases of life-threatening poisoning as a result of mushrooms, plants or snake bites are rare.

Since 2012, a total four deaths of adults or elderly persons related to poisoning due to a washing agent have been reported in Finland. The victims were between 48 and 81 years of age. The products involved in the deaths were Kodin Putkimies, Kloriitti, Tolu and various soaps (THL 2023).¹⁶

According to the cause of death statistics of Statistics Finland, the following cases of poisoning related to consumer chemicals that were accidental or unclear in terms of intent took place in Finland between 2017 and 2021:

- Accidental poisoning due to organic solvents or halogenated hydrocarbons¹⁷ or their vapours. These caused the deaths of 16 people in total.
- Poisoning or other exposure to organic solvents or halogenated hydrocarbons or their vapours. These caused the deaths of 13 people in total (intent unclear).
- Accidental poisoning due to other or undefined chemicals or harmful substances. These caused the deaths of two people in total.
- Poisoning or other exposure to other or undefined chemical substances or harmful compounds. These caused the deaths of two people in total (intent unclear).

2.8.3 Account of accidents among elderly people

According to a survey of the Finnish Institute for Health and Welfare,¹⁸ factors related to accidents and safety among the elderly (including cases of poisoning) have not been comprehensively covered in regional well-being reports or equivalent materials. Based on the survey, attention should be paid to determining the goals, measures, justifications and responsible parties with regard to accidents and safety among the elderly.

2.8.4 Poison Information Centre

The Poison Information Centre answers urgent questions related to the prevention and treatment of poisonings around the clock. The number of calls related to cases of poisoning among

¹⁶ Forensic medicine statistics. THL 2023 (unpublished).

¹⁷ Halogenated hydrocarbons are a group of chemicals many of which are long-lived and dangerous environmental toxins.

¹⁸ Salo, S.; Koivula, R. & Lillsunde P. (2020) Ikäntyneiden tapaturmat alueellisissa hyvinvointikertomuksissa. Working paper 2/2020. Finnish Institute for Health and Welfare. https://www.julkari.fi/bitstream/handle/10024/139348/URN_ISBN_978-952-343-452-3.pdf

elderly people has increased in recent years. The questions related to poisoning that are presented during calls made from nursing homes usually pertain to chemicals.

The Poison Information Centre prepared a report on calls from nursing homes with regard to chemical exposure¹⁹. There were 113 calls in seven months, 59 of which were related to washing agents. The other calls pertained to cosmetics and hygiene products (35), alcohol and hand sanitiser (13) or other substances (6). A conclusion was made that improvements should be made at nursing homes with regard to exposure to hazardous substances and chemicals.

2.8.5 Guide for treating poisoning

Duodecim has published a guide on treating poisoning (Myrkytysten hoito), the purpose of which is to help identify possible poisonings quickly and provide instructions for treatment and monitoring. The guide is intended in particular for health care professionals, and it is available on the Duodecim website. The guide also separately covers poisonings among the elderly.

Neither Current Care Guideline²⁰ nor Hotus treatment guidelines²¹ have been prepared on the treatment of poisoning.

2.8.6 The Safely at All Ages programme

One aim of the Safely at All Ages²² programme is to reduce poisoning accidents among elderly people (over 65 years of age) between 2021 and 2023. However, the cases of poisoning covered are limited to those related to the safety of drug treatment and the poisoning hazards that can be identified in relation to medication and intoxicants. That said, the programme mentions that, in order to prevent the poisoning of elderly persons, medications, as well as washing and cleaning agents, especially in long-term care units, should be kept in their original packages in locations that cannot be accessed by people with a memory disorder or otherwise impaired functional capacity.

2.8.7 National client and patient safety strategy 2022–2026

The aim of the national client and patient safety strategy and implementation plan 2022–2026²³ is to promote inclusion and safety, and to strengthen the management of safety culture. The strategy indicates that the promotion of client and patient safety requires improved risk management which, in turn, requires extensive training at various organisational levels. Competence is required to identify, assess and classify risks; plan corrective measures; and assess the efficacy of the measures. The strategy also emphasises the importance of self-monitoring in efforts to ensure client and patient safety.

Among other things, the implementation plan of the strategy covers the introduction of social welfare and health care workers to operating methods that ensure safety. The efforts to promote safety should focus on ensuring the safety of elderly clients who are taking or using a lot of medications, for example.

¹⁹ Soininen L (2018) Accidental chemical poisoning in nursing homes. Poison Information Centre. HUS. (not public material)

²⁰ Current Care Guidelines are independent, national treatment guidelines that are based on research evidence.

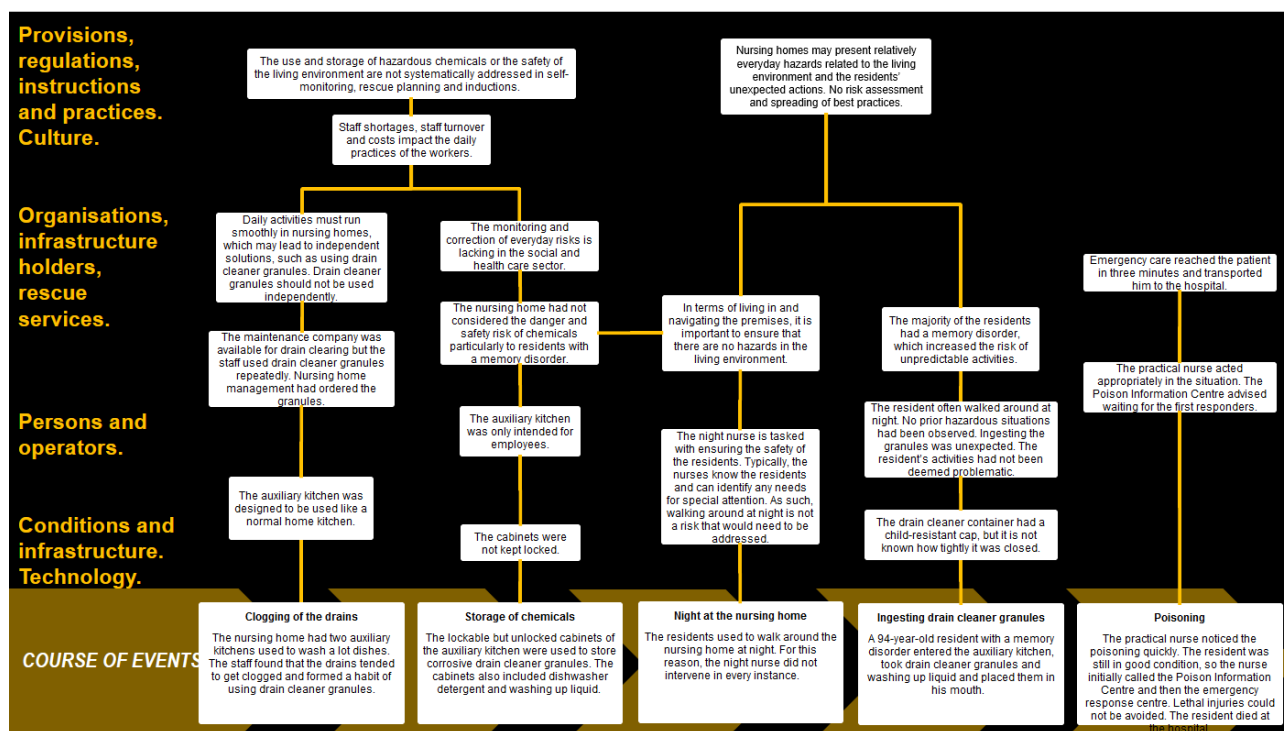
²¹ Hotus treatment guidelines are recommendations that are based on research evidence and that aim to improve the quality of care and harmonise practices.

²² Publications of the Ministry of Social Affairs and Health 2020:33.

²³ Publications of the Ministry of Social Affairs and Health 2022:2.

3 ANALYSIS

The Accimap method²⁴ refined by the Safety Investigation Authority was used to analyse the incident. The structure of the analysis text is based on the Accimap chart prepared during the investigation. The accident is described as a course of events at the bottom of the chart. The factors leading up to the course of events are addressed in the chart at various levels of analysis.



Kuva 1. Accimap analysis chart prepared by the investigation team. (Image: OTKES)

3.1 Analysis of the incident

3.1.1 Clogging of the drains

Attendo Mäntyhovi was completed in 2017, which means that the building is relatively new. The nursing home had two auxiliary kitchens, where residents' and staff's dishes were washed after meals. The drains were conventional, but the auxiliary kitchen was only designed to be used like a normal home kitchen. The drains in the sinks were frequently clogged. The property maintenance of the nursing home was outsourced to a local maintenance company, which cleared the sink drain in one of the auxiliary kitchens once during the past two years. Instead of contacting the maintenance company, the nursing home staff got into the habit of using drain cleaner granules. The drain cleaner granules had been ordered by the previous manager of the nursing home, which gave the staff the impression that ordering and using the granules was an approved and normal practice.

It is important for nursing homes to have well-functioning daily operations. Day-to-day operations are hampered significantly if building services, such as drains, do not function properly. In addition to this, smooth day-to-day operations at a nursing home can be hampered by staff

²⁴ Rasmussen, J. & Svedung, I. (2000) *Proactive Risk Management in a Dynamic Society*. Karlstad, Sweden: Swedish Rescue Services Agency.

shortages, constant staff turnover, a poor work atmosphere and ill-advised cost-oriented thinking. These can lead the employees to take measures of their own, such as using drain cleaner granules. The care staff should not use drain cleaner granules due to the related risk of poisoning.

3.1.2 Storage of chemicals

The cabinet under the auxiliary kitchen sink was used many times a day, because it was used to store washing up liquid and dishwasher detergent in addition to the drain cleaner granules. The same cabinet was also used to store biowaste bags.

The nursing home's auxiliary kitchen was part of an open living area, which meant that residents also had full access to the drawers and cupboards. Despite this, the drawers were not kept locked, even though all the consumer chemicals stored in them posed an obvious safety risk.

The label on the drain cleaner container has the symbol of a corrosive substance as well as a warning text indicating the related hazard. However, the nursing home did not take the warning into account or understand the hazard and client safety risk posed by the open storage of consumer chemicals, especially to patients with a memory disorder. The risk was evident, but the nursing home employees did not identify it despite continuous safety development being part of their daily work tasks.

The nursing home had not specifically decided or agreed on a policy on the use of locks over the years. In terms of social welfare and health care services, there are deficiencies in identifying and correcting even relatively mundane safety risks. The use and storage of hazardous chemicals is not systematically addressed in the self-monitoring plan, emergency plan or induction training.

3.1.3 Night at the nursing home

The Attendo Mäntyhovi building has one floor, but the large building has rooms for the residents along four corridors. At the nursing home, the night nurse is tasked with ensuring the safety of the residents. According to the staff allocation, only one practical nurse was present during the night of the accident. She knew the resident involved in the accident well because she was his primary nurse. Before the accident, she had noticed the resident out and about twice during the same night. At Attendo Mäntyhovi, some of the residents used to walk around the nursing home premises even at night. The nurse did not hear that the resident in question was in the auxiliary kitchen.

As such, walking around the nursing home at night is not a risk that would need to be addressed. In terms of living in and navigating the premises, it is important to ensure that there are no hazards in the living environment. Typically, the nurses know the residents and can identify any needs for special attention. Nursing homes usually account for mobility-related hazards, such as falling, collisions, entering another resident's room or getting lost outside, in a variety of ways. However, the instructions do not cover the safety of the living environment, including chemicals. For this reason, nursing homes may present hazards related to the living environment or the unpredictable activities of residents with a memory disorder.

3.1.4 Ingesting drain cleaner granules

The 94-year-old resident with a memory disorder often walked around at night, but a motion detector was not used to monitor him. At the time of the accident, he was out and about for the third time in the same night. Early in the morning, the resident entered the auxiliary

kitchen, took drain cleaner granules and washing up liquid from the unlocked cabinet and placed them in his mouth. No previous hazardous situations had been observed, and the resident's act of ingesting the drain cleaner granules was entirely unexpected. The resident used to drink bottled mineral water to quench his thirst. The drain cleaner container had a child-resistant cap, but it is not known how tightly it was closed. The resident's vision and the strength in his fingers were weakened.

The majority of the residents at Attendo Mäntyhovi had a memory disorder, which increased the risk of unpredictable activities. The functional capacity of the nursing home residents is often assessed in a variety of ways with the aim of gaining information for maintaining functional capacity. Only the staff members are covered by risk assessments related to ergonomic work or noise exposure, for example. Safety risks related to the activities of the nursing home residents are not assessed systematically. Their safety is the responsibility of the staff to a heightened degree. The safety thinking is mainly focused on drug safety and the safety of medical equipment and treatment measures. More information about safety risks or best practices to promote the safety of nursing homes should be shared among operators. For example, if a hazardous situation related to consumer chemicals is observed at a nursing home, knowledge of the risk may not be distributed and the issue may only be rectified at a local level.

3.1.5 Poisoning

At the time of the accident, the practical nurse was on call in the main lobby in the middle of the building and the resident came to her there, having ingested drain cleaner granules and washing up liquid. On her way to the resident's room, the nurse noticed the substances and mugs on the table of the auxiliary kitchen. The side of the container featured the following instructions for cases of ingesting the chemical: "Rinse mouth, do not induce vomiting." The resident was still in good condition, so the nurse initially called the Poison Information Centre and then the emergency response centre. She acted appropriately in the situation. The Poison Information Centre advised the nurse to wait for the first responders. The ambulance, which was on call at the nearby Mäntyharju fire station arrived in three minutes, which was below the target time. The injuries caused by the poisoning could not be avoided, and the resident died two days later at the hospital.

3.2 Analysis of the actions of the authorities

As supervisory authorities, Valvira and Regional State Administrative Agencies are responsible for client and patient safety at social welfare and health care operating units. The supervision is focused on permit management, supporting and developing the self-monitoring of operating units, and reactive supervision. The use and storage of hazardous chemicals and the safety of the living environment are not systematically addressed in the permit application phases or self-monitoring efforts of operating units. Identifying related hazards is left to the staff of each operating unit.

4 CONCLUSIONS

The conclusions cover the causes of the accident or hazardous situation. A cause can mean various factors leading to the incident as well as direct and indirect aspects affecting the incident.

1. The management of the nursing home had previously ordered the drain cleaner granules to clear clogged drains. The staff were under the impression that ordering and using the granules was a good practice. The frequent staff and management turnover made it more difficult to identify the safety risk. The care staff should not use drain cleaner granules.

Conclusion: *Efforts to streamline day-to-day activities at the nursing home may lead employees to take independent measures, the safety risks of which are not identified.*

2. Hazardous chemicals were stored in the nursing home in unlocked cabinets that residents could also easily access.

Conclusion: *Service housing units may store hazardous chemicals within the reach of residents without the safety risks being recognised and rectified.*

3. The drain cleaner container features the symbol for corrosive substances and the label also warns about the hazard related to the substance. The child-resistant cap also indicates that the substance is hazardous.

Conclusion: *The warning labels of chemicals may not be read or the safety risks identified because the substances are intended for consumer use.*

4. The use, storage and locking arrangements of hazardous chemicals were not addressed in the nursing home's permit application phase, self-monitoring activities, rescue plan or staff induction.

Conclusion: *The regulations concerning service housing units steer the parties involved towards the assessment of safety risks. In practice, however, an extensive systematic risk assessment may be neglected and the safety risks of the living environment, such as hazardous chemicals, may not be addressed.*

5. At the time of the incident, there was one practical nurse present at the nursing home, according to the staff allocation. When the accident happened, she was making record entries in the main lobby and did not hear the resident in the kitchen.

Conclusion: *Even if the staff allocation is sufficient in proportion to the number of residents, not all activities and movements of residents in a large building can be monitored and safeguarded.*

6. The actions of residents with a memory disorder can be unpredictable. The nursing home did not anticipate the safety risk of a client ingesting drain cleaner granules or washing up liquid.

Conclusion: *Information on the risks associated with consumer chemicals is not systematically shared. Best practices related to the safety of the living environment in service housing units are not distributed among operators.*

7. The practical nurse noticed the resident's poisoning quickly and received instructions from the Poison Information Centre. The resident was admitted for treatment without delay, but the injuries were severe and the resident died.

Conclusion: *Prevention is essential in accidents related to poisoning.*

5 SAFETY RECOMMENDATIONS

5.1 Development of a self-monitoring plan

The most important tool of service housing units in ensuring the client and patient safety is the self-monitoring plan, which guides day-to-day practical work and which must be updated continuously. The self-monitoring plan steers users towards identifying and rectifying risks and discrepancies. The nursing home employees have varying levels of knowledge of the self-monitoring plan and its content. There is no mention of the storage or use of consumer chemicals in the self-monitoring plan.

The Safety Investigation Authority recommends the following:

The National Supervisory Authority for Welfare and Health, in cooperation with Regional State Administrative Agencies, shall develop guidelines for self-monitoring plans for social and health care service providers to take more explicit account of risks in the living environment, such as the storage and use of locks in the storage of consumer chem-

Appropriately assessing, identifying and rectifying risks in service housing units requires regular inspections that produce conclusions. The identification of safety risks related to consumer chemicals and their storage is based on the service producer's own safety management efforts.

5.2 Learning from incidents in the social and health care sector

Lessons can be learned from accidents, severe hazardous situations and deviations in social welfare and health care. Operating methods that promote client and patient safety can be developed based on them. The social welfare and health care sector has been using a reporting system for safety deviations, but comprehensive information about incidents is not being gained despite this. Information on safety deviations and the resulting lessons is not being distributed at a national level and wide-reaching development measures are not being initiated. Information that promotes safety and the distribution of this information between social welfare and health care operators should be developed.

The Safety Investigation Authority recommends the following:

The Ministry of Social Affairs and Health shall ensure that a data collection and sharing system is developed in the social and health care sector. This will be used to collect relevant information on all incidents that have seriously compromised customer and patient safety and to form and publish key conclusions relevant to improving safety for the benefit of the whole sector. [2023-S18]

The recommendation was issued in the context of an investigation of information system failures within the ²⁵Hospital District of Helsinki and Uusimaa in relation to health care only. The recommendation is expanded to apply to social welfare and client safety.

²⁵ Safety Investigation Authority. *Helsingin ja Uudenmaan sairaanhoitopiirin tietojärjestelmähäiriöt 7.-8.11.2017*. Investigation report Y2018-02.

5.3 Implemented measures

Attendo Mäntyhovi provided Essote with a report on the incident. According to Attendo, care units throughout Finland have checked and improved their instructions on the storage of potentially hazardous substances and items as a result of the incident.

A section on chemicals as a hazard has been added to Mäntyhovi's rescue plan and self-monitoring plan. In addition to this, the staff of the unit have been trained on the safe use and storage of chemicals.

On 29 November 2022, the Regional State Administrative Agency for Eastern Finland initiated a supervisory case in the form of reactive supervision based on the severe service deviation at Attendo Mäntyhovi.

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Investigation materials

- 1) Photos, measurements and other materials from the site investigation
- 2) Documents of Attendo and Attendo Mäntyhovi
- 3) Hearings
- 4) Materials of the South Savo Social and Health Care Authority (Essote) (before 2023)
- 5) Materials of the Wellbeing Services County of South Savo (Eloisa) (since 2023)
- 6) Event log and recordings of the emergency response centre
- 7) The Poison Information Centre's recordings, other materials and expert interviews
- 8) Examination of the operations of a corresponding nursing home
- 9) Materials of the Regional State Administrative Agency
- 10) Materials of Statistics Finland
- 11) Materials of the Finnish Institute for Health and Welfare (THL)
- 12) Consultation with an expert of the Finnish Safety and Chemicals Agency (Tukes)

SUMMARY OF THE STATEMENTS IN THE DRAFT INVESTIGATION REPORT

The draft investigation report has been issued for statements to the Ministry of Social Affairs and Health, the Finnish Institute for Health and Welfare, the National Supervisory Authority for Welfare and Health Valvira, the Regional State Administrative Agency for Eastern Finland, the Wellbeing Services County of South Savo, the Poison Information Centre, the private service producer Attendo Oy and the family of the deceased person. Pursuant to the Safety Investigation Act, the statements provided by private persons are not published.

In its statement, the **Ministry of Social Affairs and Health (STM)** indicates that the promotion of patient and client safety is an element of quality and risk management in social welfare and health care. The Ministry finds the recommendation addressed to it very important and has taken it into account in the implementation plan for the client and patient safety strategy for 2022–2026. It is the Ministry's responsibility to ensure that the open reporting of information on the fulfilment of client and patient safety requirements with regard to publicly funded services is implemented by 2025. In October 2022, the client and patient safety strategy monitoring group established a working group tasked with updating the investigation guide for severe hazardous incidents, describing the tasks, roles and authorities of various operators, and detailing the relevant stipulations. The working group's term is set to end in May 2023, after which the monitoring group will process and publish the updated guide. The aim is to harmonise the processing of severe hazardous incidents at a national level, prevent such deviations and learn from deviations that have already occurred.

The Ministry also indicates in its statement that the new Act on the Supervision of Social Welfare and Health Care (741/2023) will take effect on 1 January 2024. According to Section 27 of the new Act, service providers must prepare unit-specific self-monitoring plans that cover all services produced by and on behalf of the service provider at each unit, in order to ensure the quality, appropriateness and safety of daily operations and monitor the sufficiency of staff participating in client and patient work. The self-monitoring plan must include a description of the notification and learning procedure related to hazardous incidents. The provisions regarding the self-monitoring obligation emphasise the responsibility of the service organisers and producers to ensure the arrangement and production of appropriate high-quality operations. The aim is to ensure service quality and the fulfilment of the rights of service users in advance, thereby preventing situations that require operational intervention by a supervisory authority afterwards.

National Supervisory Authority for Welfare and Health (Valvira) proposes additions to the text section regarding its operations as well as specifications for acts and terms referred to in the draft investigation report.

In relation to the recommendation addressed to it, Valvira emphasises that the supervision of chemical safety is not one of its responsibilities. For this reason, Valvira does not support issuing a recommendation to Valvira and instead suggests that chemical safety be included in the rescue plan.

Alternatively, Valvira states that the recommendation should also be addressed to the Regional State Administrative Agencies, in addition to Valvira, because they are the main supervisory authorities in their areas and responsible for organising social welfare and health care services in the wellbeing services counties. Valvira does not support a separate mention of chemical safety.

The Finnish Institute for Health and Welfare (THL) indicates in its statement that it has nothing to state with regard to the draft investigation report.

The Regional Administrative Agency for Eastern Finland indicates in its statement that it has nothing to state with regard to the draft investigation report.

The Wellbeing Services County of South Savo (ELOISA) indicates in its statement that it has nothing to state with regard to the draft investigation report.

Attendo Oy indicates in its statement that it is the opinion of Attendo Oy that the draft investigation report matches the course of events in question and presents the causes and repercussions of the accident. Attendo Oy is strongly in support of the measures recommended in the draft investigation report with regard to the self-monitoring plan (Valvira) and national database (STM). Attendo Oy points out in its statement that it has taken numerous measures at Attendo Mäntyhövi since the accident.