



STAFF WORKLOAD AND DELAYS IN SOLID MEDICAL WASTE MANAGEMENT IN A HOSPITAL

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ABSTRACT

Delays in solid medical waste management allow waste to accumulate in temporary storage and raise health and environmental risks, and staff workload is a plausible but poorly explained contributor. Objective to explore how staff workload contributes to delays in solid medical waste management at Tk II Prof. Dr. J. A. Latumeten Hospital, Ambon, Indonesia. A qualitative case study was conducted in July 2026. Seven informants directly involved in waste management were interviewed in depth, and observation and document review supplemented the interviews. Data were analysed through data reduction, data display and conclusion drawing. Only two officers handled solid medical waste, without shift arrangements. Four themes explained how workload led to delay: a limited number of staff, concurrent duties, rising waste volume and an unstructured work schedule. These pressures delayed collection and transport from wards to the temporary storage facility, and they interacted with the lack of an incinerator and irregular third-party transport. Perceptions differed by role. Workload is a dominant cause of delay in this hospital.

Keywords: delay; hospital; medical waste management; staffing; workload

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INTRODUCTION

Hospitals save lives, but they also generate waste that can endanger patients, health workers, surrounding communities and the environment when it is not handled properly. Most health-care waste (about 85%, according to the World Health Organization [WHO], 2024) resembles household refuse and carries no special hazard, the remaining fraction, around 15%, is classed as hazardous because it may be infectious, chemical or radioactive. Pathogens in this waste can reach patients, staff and members of the public, and injuries from sharps, as well as infections, are among the harms linked to it (WHO, 2024). Although the hazardous share is small, its consequences are serious, so every stage of the waste chain, from segregation where the waste is produced to final treatment, has to work dependably.

In Indonesia, health-care facilities handle solid medical waste in successive steps that run from segregation and containment through collection and transport to temporary storage and, finally, treatment or destruction (Nabilla et al., 2021). The technical requirements are set out mainly in Ministry of Environment and Forestry Regulation No. P.56/Menlhk-Setjen/2015 on hazardous and toxic waste from health-care facilities (Kementerian Lingkungan Hidup dan Kehutanan [KLHK], 2015) and in Ministry of Health Regulation No. 2 of 2023, the implementing regulation of Government Regulation No. 66 of 2014 on environmental health (Kementerian Kesehatan Republik Indonesia [Kemenkes RI], 2023). One of the most visible requirements concerns time is infectious waste is expected to leave the temporary storage facility (tempat penyimpanan sementara, TPS) within two days, that is, 2×24 hours (KLHK, 2015; Palita et al., 2024).

In practice, this requirement is often not met. A regional hospital in Palu, Central Sulawesi, kept solid medical waste in its hazardous-waste TPS for over three months while waiting for a delayed third-party pick-up, and the authors advised the hospital to procure its own treatment equipment (Palita et al., 2024). Qualitative work at a Class D hospital in the Riau Archipelago linked the

build-up of solid waste to tight finances, the lack of an incinerator, costly and difficult inter-island shipping, too few and insufficiently trained staff, and collection schedules that were not reliably kept (Rosnadi et al., 2025). Even in a Pekanbaru hospital whose waste handling as a whole met national regulation, uneven transport schedules and late collection were identified as problems (Melina et al., 2025). A regional hospital in Bangkinang likewise reported waste staying in storage beyond 2×24 hours, occasionally for as long as a month (Nabilla et al., 2021).

Much of the literature explaining such delays and poor practice focuses on infrastructure, funding and knowledge. A review of medical waste management in developing countries identified poor training, financing and infrastructure, together with weak regulatory frameworks, as key problems (Baaki et al., 2022), and a narrative review covering African countries tied improper handling, transport and storage of waste to underfunded health systems, little training and low awareness of the rules (Chisholm et al., 2021). Training gaps are visible at the front line as well. Zambian survey, only 37.3% of respondents remembered ever receiving any health-care waste management training (Leonard et al., 2022). WHO (2024) also counts shortages of human and financial resources among the causes of weak health-care waste services. Human resources are therefore not a side issue. The number of people available, what else they are required to do and how their time is organised determine whether the procedures written in standard operating procedures (SOPs) can be carried out on schedule. In Nepalese district hospitals, for example, key-stakeholder interviews showed that waste handlers held no graded post, that they tended to stay only briefly, and that the number of trained handlers could not be properly determined (Patel et al., 2024).

Workload refers to the demands a job places on a worker, in terms of how much work has to be done and how much time is available to do it. In job demands–resources (JD–R) theory, such demands drain energy and erode health when they call for sustained effort without being balanced by sufficient resources, and the resulting strain can build up into exhaustion and burnout (Bakker et al., 2023; Demerouti & Bakker, 2023). Maslach and Leiter (2022) likewise name workload as one of six areas of working life in which a poor fit between person and job promotes burnout. Applied to waste management, a high workload arises when the number of staff is out of proportion to the volume of waste and the area to be served, and it may show up as late collection, hurried segregation or skipped procedures. Direct evidence on the role of workload in this particular setting is limited. The most relevant study is a cross-sectional survey of all 50 cleaning-service staff at a hospital in Bangkinang, which found that those carrying a heavy workload were much more likely than those with a light workload to practise medical waste management poorly (Nabilla et al., 2021). Such a statistical association cannot show the route by which workload produces delay or the stages of the waste chain that it affects, and first-hand qualitative accounts from frontline workers in eastern Indonesia are scarce in the literature we reviewed.

The study drew on Lawrence Green's PRECEDE–PROCEED framework, which sorts the influences on behaviour into predisposing, enabling and reinforcing factors (Green et al., 2022). In the adapted framework applied in the underlying research project, knowledge and workload were treated as predisposing factors, facilities and infrastructure as enabling factors, and supervision and SOP compliance as reinforcing factors. This article reports only the workload component of that project. Tk II Prof. Dr. J. A. Latumeten Hospital in Ambon, Maluku, is a case in which these concerns converge. A preliminary interview with the hospital sanitarian indicated that only two officers handled solid medical waste and that no shift system was in place. Preliminary observation found waste stored in the TPS for about one month, far beyond the maximum of 2×24 hours stipulated in Regulation P.56/Menlhk-Setjen/2015 (KLHK, 2015), while removal depended on a third-party transporter whose shipping schedule was irregular. The hospital also had no incinerator for final treatment. In an archipelago, a hospital cannot count on frequent collection by a transporter, so the internal organisation of collection and storage matters even more.

Clarifying the role of workload is useful for two reasons. First, unlike the absence of an incinerator, which requires capital investment and external approval, workload is largely modifiable by hospital management through staffing, task allocation and scheduling. Second, an explanation grounded in the accounts of the people who do the work can show which stages of the chain are most exposed and which remedies are realistic. The purpose of this study was therefore to explore how staff workload contributes to delays in solid medical waste management at this hospital, by describing how informants perceive their workload, the circumstances that make it high, and the stages of the waste chain at which it leads to delay.

METHOD

This was a qualitative study with a single-case design. Case-study methodology is commonly chosen to build a deep, holistic understanding of a specific phenomenon within a defined context, particularly when the context is complex and the researcher has little control over events (Sibbald et al., 2021). In line with that guidance, the case was bounded by place and time, namely one hospital in July 2026, and several data sources were combined. The phenomenon of interest, delay in solid medical waste management, cannot be separated from the hospital's staffing, facilities, transport arrangements and geography, and the case-study design allowed these to be examined together. The study was conducted at Tk II Prof. Dr. J. A. Latumeten Hospital, Ambon, Maluku Province, Indonesia. Data were collected in July 2026.

Informants were selected by total sampling of the staff directly involved in solid medical waste management at the hospital, which gave seven informants. They were classified into three groups: key informants (the hospital occupational health and safety [K3RS] officer and the waste manager), main informants (the waste transport officer and two cleaning-service staff) and supporting informants (a member of the infection prevention and control [PPI] team and a ward nurse). Informants are identified in this article by codes (A1, A2, B1, B2, B3, C1 and C2) rather than by name. Three techniques were used. In-depth interviews were guided by a semi-structured interview guide and were conducted face to face. The workload section of the guide covered the informant's perception of their workload and whether it was high; whether workload had ever delayed transport; whether a shortage of staff affected waste management; concurrent duties outside the main task and their effect; whether doing many tasks at the same time affected the timeliness of transport; the effect of waste volume on workload; whether limited time had caused delay; whether the division of tasks and working hours matched the workload; and the obstacles related to workload and possible remedies. Probes were used to draw out fuller and richer answers from informants (Robinson, 2023). Observation, guided by an observation sheet, recorded the stages of solid medical waste management, namely segregation, containment, collection, transport, temporary storage and treatment or destruction, and the factors visible in the field that were related to delay. Documentation provided written and other material from the hospital that supplemented the interview and observation data. Interviews were recorded with a mobile telephone, supplemented by a notebook, and a camera was used for documentation.

The interviews were transcribed and analysed with the interactive model attributed to Miles and Huberman, which comprises three linked activities: data reduction, data display, and drawing and verifying conclusions (Qomaruddin & Sa'diyah, 2024). Reduction meant selecting, focusing and simplifying the field notes and transcripts, and it went on throughout the study. The reduced material was organised in matrices and narrative text so that patterns became visible. Conclusions were formed tentatively from the start of data collection and were verified against the interview, observation and documentation data as the work progressed, for example by revisiting field notes and cross-checking against other data (Qomaruddin & Sa'diyah, 2024). Using three sources of data made it possible to cross-check statements against what was observed and documented. The interviews were conducted in Indonesian and in Ambonese, and the excerpts reported here were translated into English by the authors. The reporting of the workload theme is organised around the framework described in the Introduction.

RESULT

Characteristics of the informants. Seven informants took part. As shown in Table 1, four were women and three were men, and they occupied six different positions at the hospital. The workload-related excerpts reported below are drawn from the informants who spoke on this theme.

Table 1.
Informant characteristics (n = 7)

Informant characteristics	f	%
Gender		
Male	3	42.9
Female	4	57.1
Informant category		
Key informant	2	28.6
Main informant	3	42.9
Supporting informant	2	28.6
Position		
Occupational health and safety (K3RS) officer	1	14.3
Solid medical waste manager	1	14.3
Solid medical waste transport officer	1	14.3
Cleaning-service staff	2	28.6
Infection prevention and control (PPI) team member	1	14.3
Ward nurse	1	14.3

Informants described workload in very different terms (Table 2). The waste manager, the waste transport officer and the cleaning-service staff described a high workload, while the K3RS officer reported none and the ward nurse described it as adequate. Four themes accounted for how workload translated into delay.

Table 2.
Informants' perceptions of workload and its relation to delay

Informant	Perceived workload	Delay attributed to workload	Work schedule
A1, K3RS officer	No workload; not high	Never; yet acknowledged that limited staff affect the process	No division of working time; regarded as appropriate
A2, waste manager	Fairly heavy; solid and liquid waste handled by two staff	Yes; waste piles up	No division of working time; not appropriate
B1, waste transport officer	Large; transport plus other duties	Yes; late reminders to cleaning staff, waste piles up	No division of working time; not appropriate
B2 and B3, cleaning-service staff	Large, with room cleaning; "not too high but fairly"	Reported "never", but collection can be late when several rooms must be cleaned	Working hours in the morning and in the afternoon
C2, ward nurse	Adequate, not much	Never	Morning and night shifts; appropriate

Theme 1: a limited number of staff makes the workload high. The waste manager explained, "My workload is fairly heavy because besides managing solid medical waste I also handle liquid waste, since there are only two waste managers, not to mention other tasks" (A2). He or she added that when staff are few, the work becomes heavier and transport time can be late. The transport officer agreed: "If there are too few staff, one person has to do several jobs so that waste transport cannot always be done properly" (B1). The cleaning-service staff made the same point about their own unit: when cleaning staff are short, the work increases and, as a result, collection of waste from the wards can be late. The K3RS officer, who reported no workload of his or her own, nonetheless agreed that a limited number of staff can affect waste management (A1). The ward nurse said that when ward staff are few the nurses' work increases, although transport itself is handled by other staff (C2). Taken together, these accounts show that a shortage of hands was recognised across roles, and that it was felt most acutely in collection and transport.

Theme 2: concurrent duties compete with waste handling. The waste transport officer described himself or herself as the only person with a qualification that matches the job and one who also worked at the medical support unit (Jangmed): “My workload is large because I am the only one with a qualification that matches this job, and besides transporting waste I have other duties as a staff member at the medical support unit and must do all kinds of work such as repairing air conditioners” (B1). The cleaning-service staff were responsible for cleaning rooms and hospital areas as well as handling waste. Competing duties forced prioritisation. “When there is a lot of work, staff have to decide which job to do first, so waste transport is sometimes late,” said the waste manager (A2). The K3RS officer saw the problem as one of coordination: simultaneous tasks affect transport time “if task coordination does not go well” (A1). Cleaning-service staff reported that when several rooms had to be cleaned at once, collection of waste could be late. The consequences were concrete. The waste manager said that when other work coincided with the waste schedule, “the waste piles up” (A2). The transport officer reported that when workload was higher, reminders to the cleaning staff were given late and the waste sometimes piled up, and that this happened especially when a colleague was ill (B1). Forgetting, which the transport officer linked to the workload, was one of the pathways through which delay arose.

Theme 3: rising waste volume adds to the workload. All informants agreed that volume affects workload. The K3RS officer said that “the more waste is produced, the greater the need for supervision in the management process” (A1). For the waste manager, “when waste volume increases, the work from collection through transfer to management becomes greater” (A2). The transport officer said that when much waste is produced, “the time and effort needed to transport it are also greater” (B1). Cleaning-service staff said there is more to collect and clean. The ward nurse linked volume to patient numbers: when there are many patients, nurses “have to segregate more often and replace containers that are full” (C2). According to the informants, volume affected four stages: segregation, collection, transport and supervision.

Theme 4: the work schedule is not structured. The waste manager and the transport officer both said that there was no division of working time for solid medical waste handling and that the arrangement was not appropriate to the workload. The K3RS officer also reported that there was no division of time but considered the arrangement appropriate. Cleaning-service staff worked in the morning and in the afternoon. Only the ward nurses had a formal shift system (morning and night), which they regarded as appropriate. Informants who reported time limits tied them to this lack of structure: the waste manager said delays occurred “if there is other work that has to be finished and its time coincides with the waste management schedule,” and the transport officer said that when the time available is limited and the work is plentiful, transport can be delayed.

Table 3.

Workload themes, mechanisms and stages of the waste chain affected

Theme	Mechanism leading to delay	Stage affected	Informants
Limited number of staff	Few staff must cover several kinds of waste and areas; work cannot always be done on time	Collection, transport	A1, A2, B1, B2/B3, C2
Concurrent duties	Attention and time are divided; staff must prioritise; reminders are forgotten; absence of a colleague increases the load	Collection, transport, coordination	A1, A2, B1, B2/B3
Rising waste volume	More segregation, container changes, collection and transfer per shift without extra staff	Segregation, collection, transport, supervision	A1, A2, B1, B2/B3, C2
Unstructured work schedule	No fixed time for collection, transfer and transport; work coincides with other duties	Collection, transfer, transport	A1, A2, B1, B2/B3, C2

Obstacles and suggested remedies. Asked about obstacles related to workload, the K3RS officer named limited staff and the lack of an incinerator, and proposed providing an incinerator as soon as possible. The waste manager said, “my hope is that suitable staff are provided to take over one

of the workloads so that I can focus on just one job” (A2). The transport officer asked for more staff from the appropriate field, such as environmental health (B1). The cleaning-service staff and the ward nurse reported no obstacles.

Workload and the facilities context. Informants also placed workload within a wider set of constraints. The K3RS officer said that delay at the TPS stage occurred because transport by the third party was delayed. The waste manager mentioned transport constraints, and the transport officer reported that limited container capacity meant that some waste could not be taken away immediately. The hospital had no incinerator and relied on a third party for final treatment and destruction. When volume was high and removal was late, waste remained in the TPS while the staff continued to collect from the wards, so that the work of the two officers grew while the waste could not leave.

DISCUSSION

This study set out to explain how staff workload contributes to delay in solid medical waste management at a hospital in Ambon. The informants’ accounts point to a consistent mechanism. Two officers had to manage all solid and liquid waste, they carried other duties, volume rose and fell with patient numbers, and no schedule protected the time needed for collection and transport. Under these conditions late collection, late reminders and piling up of waste were reported by those who did the work. The informants who handled waste directly described workload as a cause of delay, whereas the K3RS officer and the ward nurse, who are further from the daily handling of waste, did not. Workload emerged as one of the two dominant factors behind delay (the other being facilities), and, in the account of the informants, it was reinforced by the lack of an incinerator and by irregular third-party transport (Rumkit Tk. II Dr. J.A. Latumeten, 2026).

The first theme, a limited number of staff, fits what other studies describe in other settings. Nabilla et al. (2021) surveyed 50 cleaning-service staff at the Bangkinang hospital where 29 reported a heavy workload, and poor waste-handling practice was seen in 24 of them (82.8%) against 8 of the 21 staff with a light workload (38.1%), an association with an odds ratio of 7.8 (95% confidence interval 2.15–28.75, $p = 0.003$). Our informants’ accounts supply a mechanism that such an association cannot show. When two officers must cover collection, transfer and management of both solid and liquid waste, there is no slack when anything goes wrong. The informants named collection and transport as the points at which a shortage of staff showed itself, and these are the stages closest to the 2×24 -hour limit. Because the Bangkinang study was cross-sectional and the present one is qualitative, neither can establish causation, but the quantitative association and the qualitative mechanism point in the same direction.

The staffing difficulties look structural as well as numerical. Patel et al. (2024) found that, in Nepalese district hospitals, waste handlers occupied no graded position in the government staffing scheme, were hired locally in ways that encouraged turnover, and could not be reliably counted as trained. In the Riau Archipelago, Rosnadi et al. (2025) described too few and untrained staff alongside a tight budget and no incinerator, and their document review found no decree designating who should collect waste from each room. In our case, the transport officer’s remark that he or she was the only one with a qualification matching the job, and the request for staff from environmental health, suggest a similar gap between the competence that the work requires and the people who are assigned to it. WHO (2024) names inadequate human and financial resources as one cause of poor health-care waste services, and reviews of developing countries point to poor training, financing and infrastructure as recurring weaknesses (Baaki et al., 2022; Chisholm et al., 2021). Adding people is thus only part of the answer. The people added need to have the right qualifications, and the posts need to be recognised in the hospital’s structure.

JD–R theory helps explain why the shortage of staff mattered. Job demands such as work pressure drain employees’ energy and ultimately harm their health, whereas resources, for example people,

time, equipment, autonomy and support, help them cope (Bakker et al., 2023; Demerouti & Bakker, 2023). Here the demands were heavy and the resources thin: two officers, no shift system and no incinerator to shorten the chain. Informants did not talk about exhaustion directly, and we did not measure it. Still, the research team judged that long-lasting strain of this kind could bring fatigue, poorer concentration and a greater risk of procedural mistakes, a possibility in line with the burnout literature (Maslach & Leiter, 2022) that follow-up studies should examine. Tseng et al. (2022), drawing on 18 experts in Indonesia's medical and health-care industry, placed occupational safety, together with environmental impacts, in the group of cause attributes that drive other aspects of sustainable waste management, which supports the idea that the safety and well-being of waste handlers cannot be separated from how the system performs.

The second theme, concurrent duties, shows how delay can arise even when the total number of staff on paper seems sufficient. The transport officer was also a staff member of the medical support unit and was expected to repair air conditioners and perform other tasks, cleaning-service staff were responsible for general cleaning as well as waste, the waste manager handled liquid waste in addition to solid waste. In such conditions, staff described having to decide what to do first, and waste handling was sometimes the task that waited. Nabilla et al. (2021), citing earlier work, make a similar point: the more additional tasks a person takes on, the heavier the workload, and when this lasts it leads to work fatigue. The informants' account of forgetting to give reminders to the cleaning staff and of delays when a colleague was ill indicates that the system had no buffer, if one person was absent or occupied, nobody else covered the task. Rosnadi et al. (2025) documented comparable organisational gaps, no decree naming the staff responsible for collecting waste from each room, and no SOP setting out the route and schedule of internal transport. A hospital in which waste handling is formally assigned, protected from competing duties and backed by a named substitute is less likely to experience such delays.

Schedules deserve attention in their own right. Melina et al. (2025) listed uneven transport schedules as a weakness at a Pekanbaru hospital which is the external transporter at times turned up ahead of the agreed time, before waste from the wards had all reached the TPS, so hospital staff had to hurry and work off-schedule to bring the infectious waste in. That case shows that time pressure can arise from the mismatch between internal collection and external transport even when the number of staff is adequate. In our hospital, the lack of a defined time for collection, transfer and transport, reported by three of the five informant groups, meant that waste handling had to fit in around other work rather than the reverse. Only the ward nurses, who worked in morning and night shifts, had a structured schedule, and they were the group that reported no delay attributable to workload. This observation is descriptive and should not be over-interpreted, but it suggests that a defined schedule may be associated with a more manageable load. The practical lesson is that scheduling, which costs little, should be part of the response to workload before, or alongside, any increase in staffing.

The third theme, volume, fits the literature on surges in waste. In the preliminary interviews of Nabilla et al. (2021) at the Bangkinang hospital, seven of ten cleaning-service staff said their workload was high because medical waste had risen during the COVID-19 pandemic. At the global level, waste quantities increased in countries that applied stay-at-home measures, with greater use of single-use products among the drivers (Sarkodie & Owusu, 2021). Waste handlers bore the consequences. In a qualitative study of 17 handlers at a tertiary hospital in Mumbai, they described difficulty in segregating and transporting waste and exhaustion linked to wearing protective equipment (Shah et al., 2022). Such findings show the other side of the problem which is when volume or risk rises, the burden on the people who handle waste rises with it. Our informants did not describe a pandemic surge. They described the ordinary variation that comes with patient numbers. Even so, they said that segregation, collection, transport and supervision all expanded when volume rose, and the nurses' remark that they had to segregate and replace containers more often shows that the burden is shared by clinical staff and not only by waste

officers. Hospitals that plan staffing for average volume may therefore be exposed whenever volume peaks.

Workload did not act alone. The informants described delay at the TPS stage as the result of late third-party transport, transport constraints and limited container capacity, and the hospital had no incinerator. Other Indonesian hospitals show the same pattern. In Palu, a delayed third-party pick-up left waste in the TPS for more than three months (Palita et al., 2024), and in the Riau Archipelago, the expense and difficulty of shipping waste between islands and the absence of an incinerator were central to the build-up (Rosnadi et al., 2025). A review of African countries likewise connects limited funding with failures in the removal, transport and storage of medical waste (Chisholm et al., 2021). We interpret the interaction as mutually reinforcing. When waste cannot leave the TPS, it accumulates while collection from the wards continues, so the volume that staff must handle, store and monitor grows. Conversely, when staff are too few or too busy to collect and consolidate waste on time, the third-party vehicle or container is not filled efficiently and the opportunity for removal may be missed. Interventions that address only one side are therefore likely to be less effective than interventions that address both.

The difference in perceptions between roles is an important finding in itself. The K3RS officer reported no workload and no delay caused by workload, while acknowledging that limited staff could affect waste management. The cleaning-service staff reported that delay had never happened but also described late collection when several rooms had to be cleaned at once and the waste manager and the transport officer reported high workload and delay. The divergence may reflect proximity to the work. Those who collect, transfer and transport waste feel the demand directly, whereas managers and clinicians see only part of the chain. It may also reflect differences in how workload is understood, since some informants appeared to associate workload with being under pressure rather than with the amount of work to be done, and possibly a reluctance to describe their own unit as overburdened. This is a reason to treat self-reported workload cautiously and to complement it with objective information, such as a count of tasks, a measurement of the time that each task takes and the number of staff in relation to the volume and area served.

Seen through the framework of Green et al. (2022), the findings suggest that workload, treated here as a predisposing factor, cannot be separated from enabling factors such as the incinerator, containers and TPS capacity, nor from reinforcing factors such as SOPs and supervision. The K3RS officer's remark that greater volume increases the need for supervision illustrates the link between workload and reinforcement. When the demand on staff rises, so does the demand for supervision. This implies that a programme to improve timeliness should combine measures across the three categories rather than relying on one.

Several implications follow for practice. First, the hospital should carry out a formal workload analysis for the waste management function, using task inventories, time estimates and volume data, in order to determine the number and the qualifications of staff needed. Second, concurrent duties should be reduced, so that officers who handle waste are not simultaneously responsible for unrelated work, and a named substitute should be designated for periods of absence or illness. Third, the hospital should define and communicate a schedule for collection from wards, transfer to the TPS and handover to the transporter, together with a division of working time that matches the peaks in waste generation, and it should coordinate this schedule with the transporter, as the experience in Pekanbaru shows how a mismatch can generate pressure (Melina et al., 2025). Fourth, staff with a background in environmental health should be considered for the waste function, as requested by the informants. Fifth, management should address the facilities that amplify workload, including container capacity, the quality of the TPS (including cooling, where feasible) and the question of whether an incinerator or an alternative treatment arrangement can be provided, as recommended in other Indonesian hospitals (Palita et al., 2024; Rosnadi et al., 2025).

Finally, because staff in this study reported forgetting to give reminders, simple tools such as checklists and daily logs could reduce the reliance on memory.

The study has limitations. It is a single-case study with seven informants, so the findings cannot be generalised statistically, although the mechanisms described may be transferable to hospitals in similar situations, particularly those in archipelagic regions with a limited number of waste officers. Data collection was short and was constrained by the informants' training and work schedules, which made it difficult to meet some informants at length. The interviews were not as in-depth as intended, and probing was not used optimally, so some answers were brief. A mobile telephone used as the recorder ran out of battery, and some interviews had to be written down by hand, which may have caused some information to be recorded incompletely. Excerpts were translated from Indonesian and Ambonese, which may have changed nuances. Workload was assessed by self-report and not by objective measurement. Finally, the informants were selected by total sampling of the staff directly involved, which means that perspectives of hospital management beyond the K3RS officer and the PPI team were not sought. Despite these limitations, the use of interviews, observation and documentation, and the consistency of the accounts across the informants who handle waste directly, support the credibility of the main findings. Future research could combine qualitative accounts with objective workload measurement, such as task analysis and time studies, and test whether changes in staffing, task allocation and scheduling shorten storage times. Studies in several hospitals in Maluku and other archipelagic regions would show whether the pattern found here is typical, and studies that include hospital management, third-party transporters and regulators would clarify how workload and the logistics of removal interact.

CONCLUSION

Staff workload is a dominant cause of delay in solid medical waste management at the hospital studied. Too few officers, concurrent duties, rising waste volume and the lack of a structured work schedule combine to make collection and transport late, and they interact with the lack of an incinerator and with irregular third-party transport so that waste accumulates in temporary storage. The perceptions of workload differ by role, which suggests that objective measurement should accompany self-reports.

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