

Reduce and Manage the Number of Biohazard Waste Bins Usage

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1. PROBLEM Statement

Increased number of biohazard waste bins generated in Parkway East Hospital (PEH) from 2018 to 2022 has seen an increase from 1599 to 1944 bins; a 9% to 27% increase which is above the 5% annual growth reported by Singapore from 2016 to 2020.

3. AIM Statement & TARGET

To achieve 20% reduction of biohazard waste bins generation within 12 months, from January 2023 to December 2023.

2. BACKGROUND Information

From 2018 to 2022, the number of biohazard waste bins generated in PEH rose from, 1599 to 1944, reflecting an increase from 9% to 27%, surpassing Singapore's reported annual growth rate of 5% from 2016 to 2020.

4. MEASURE & INDICATOR

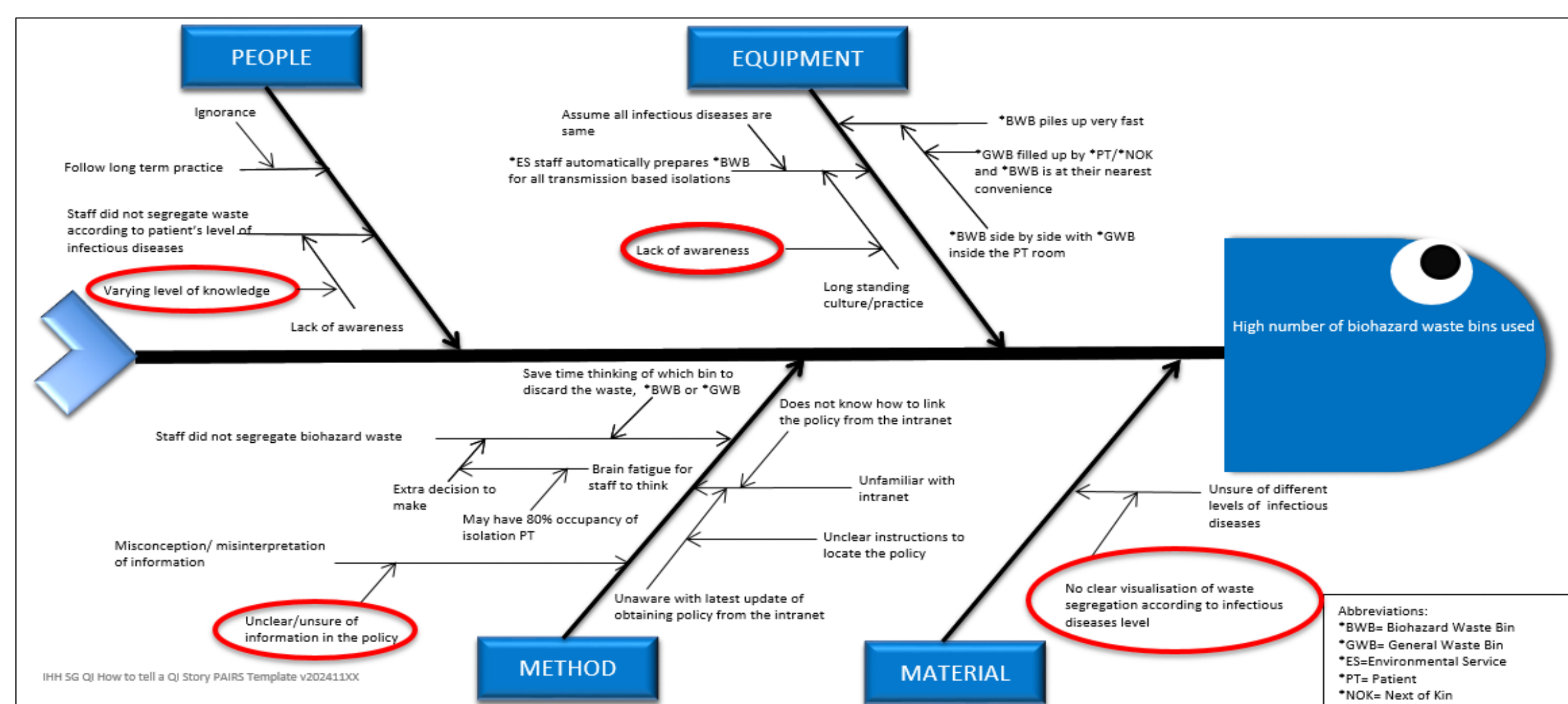
Number of biohazard waste bins generated.

$$\text{Percentage of biohazard waste bins} = 100 - \left[\frac{\text{Number of annual biohazard waste bins-current year}}{\text{Number of annual biohazard waste bins-previous year}} \times 100 \right]$$

Despite waste minimising efforts, it was challenging to entirely avoid, reduce, or recycle disposable medical items without compromising patient safety. Therefore, it is important to control waste generation. If not controlled, it will increase costs to PEH in waste disposal/incineration, safety issues to personnel involved in waste handling (i.e. pathological, sharps, infectious products), and also, it will hamper IHH's aim to achieve net zero carbon emissions by 2050.

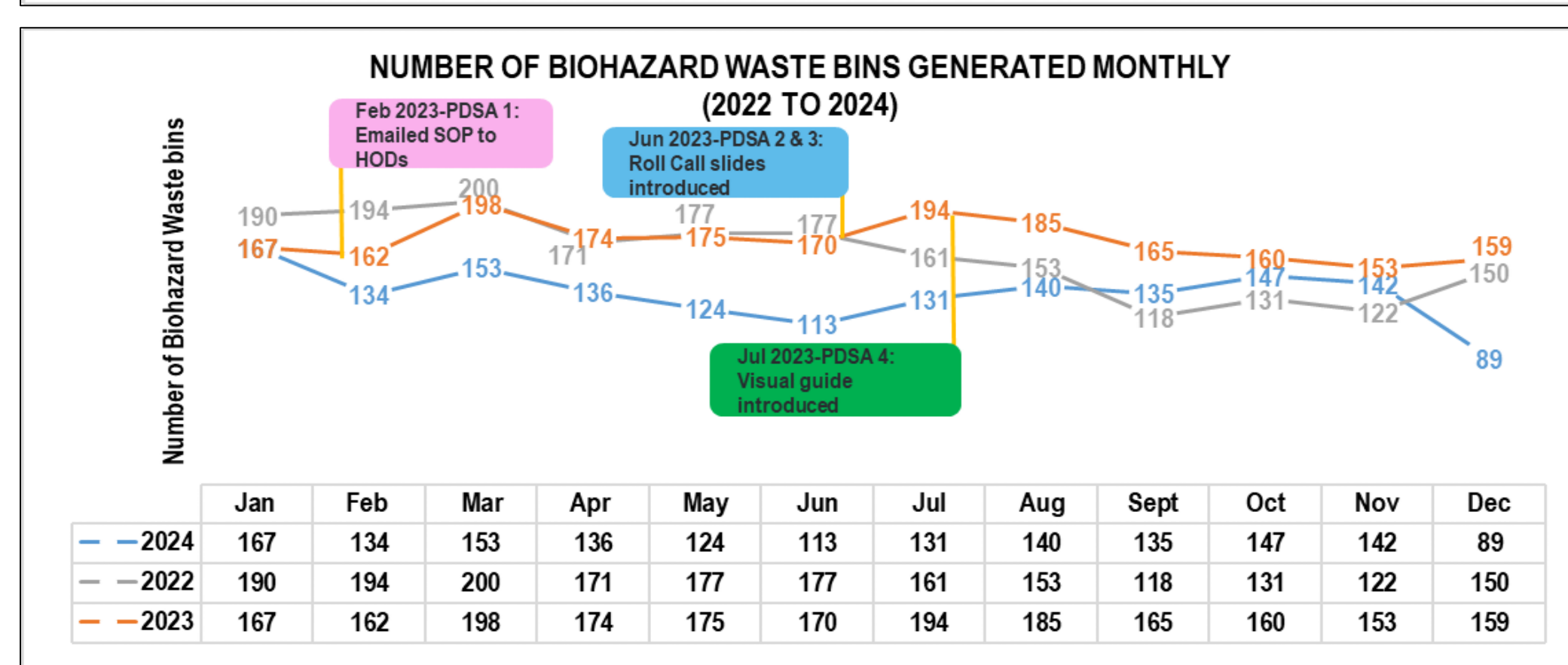
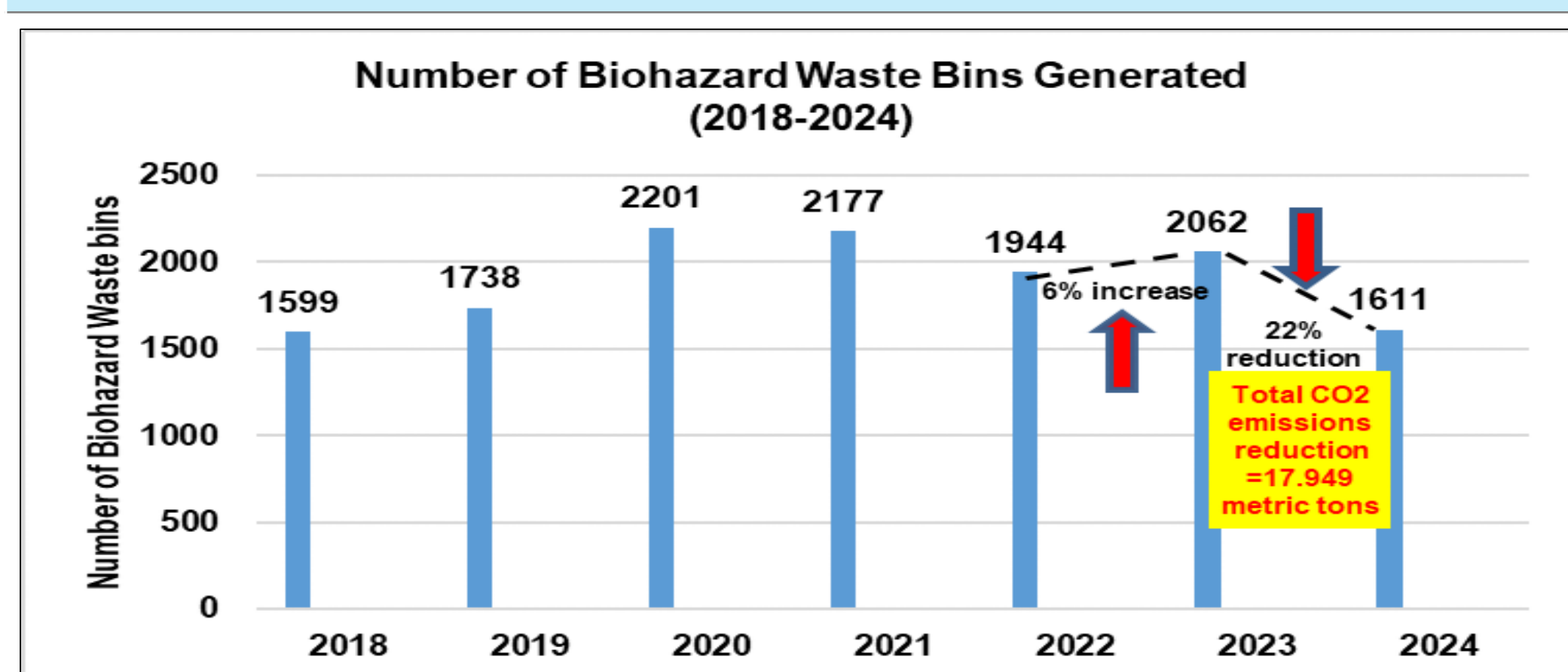
5. CHANGE STRATEGY

Utilising the Plan-Do-Study-Act (PDSA) cycle, an iterative four-stage problem-solving model, we aimed to improve the current process and implement changes effectively. An email was sent to all Heads of Departments (HODs) detailing the classification of biohazard waste according to the hospital's standard operating procedure for safe handling and disposal. Additionally, visual guides were shared through roll call slides, which helped create a clear understanding among staff and led to the desired outcomes. All HODs received and disseminated the SOP to the ground. Compliance to implementation of new process was observed.



Cause #	PRIORITISED CAUSES	CHANGE IDEAS (Actionable Solutions)	PDSA Cycle
Cause #1	Unclear/unsure of information in the policy	Email to all Heads of Departments on the classification of Biohazard Waste as per SOP_PIC_013: Safe Handling and Disposal of Hospital Waste	PDSA #1
Cause #2	Varying level of knowledge	Educate the nurses, allied health and ancillary staff (through roll call slides) that not all infectious diseases and transmission based isolation waste are required to be discarded into the biohazard waste bins	PDSA #2
Cause #3	Lack of awareness		PDSA #3
Cause #4	No poster to indicate clear visualisation of waste segregation according to infectious diseases level	Create Visual Guide in the roll call slides	PDSA #4

6. RESULTS



7. LESSONS LEARNT

Between 2022 and 2023, there was a 6% increase in the number of biohazard waste bins disposed of, accompanied by a 30% rise in disposal costs. This cost increase was largely influenced by a change in biohazard waste disposal vendors in December 2022, with the new vendor charging 42% more than the previous one. Despite the higher waste volume and costs in 2023, the project's initiatives have proven effective. This is demonstrated by a 22% reduction in both biohazard waste bins and costs from 2023 to 2024. Additionally, carbon dioxide (CO2) emissions decreased by 17,949 metric tons, further highlighting the project's success.

Staff awareness and staff education on safe biohazard waste management is an effective strategy for reducing biohazard waste, but needs continuing efforts to ensure results gained are not lost. Therefore, the clarity of goals, data accuracy and the effectiveness of reduction strategies are essential for continuous improvement and knowledge sharing.