

CASE STUDY:
INDOOR AIR QUALITY

Step 1: Fishbone Diagram to Identify Root Causes of Health, Safety and Well-being Concern

Indoor air quality concerns and upkeep of maintenance at the facility

Accumulation of dust

High exposure to dust

Dust buildup due to poor maintenance – with regards to surface, vent, filters and dust cleaning

Housing control units in small spaces cause increased exposure to dust because they are isolated/no maintenance.

Mold issues

High exposure to mold throughout

Inmates clean and are not allowed access to housing control units

Mold problems contribute to sinus & health as seen growing on cells, vents, especially in segregation units

Poor temperature control

Old buildings with poor temperature and humidity control.

Irregular temperature patterns throughout, especially after administration goes home and AC is turned down.

COs do not have control over AC, only Administration does.

Inmates cover vents causing irregular temperature patterns throughout.

Inadequate cleaning of HVAC system and filters

Irregular maintenance schedule which leads to poor maintenance of HVAC system



Step 1: Identify Root Causes -- Sub-Issues and Contributing Factors

General Health and Safety Concern:

Concerns regarding poor indoor air quality and upkeeping of maintenance at facility

Sub-Issue:	Sub-Issue:	Sub-Issue:	Sub-Issue:
Accumulation of dust throughout the facility	Issues with mold throughout facility	Inadequate cleaning of HVAC system filters	Poor temperature control
Contributing Factors:	Contributing Factors:	Contributing Factors:	Contributing Factors:
<p>High exposure to dust</p> <p>Dust buildup due to poor maintenance – particularly with regards to surface, vent, filters, and dust cleaning</p> <p>Small spaces, such as housing control units cause increased exposure to dust because they are small, isolated and do not receive regular maintenance</p> <p>Most cleaning is done by inmates and they are not allowed to access housing control units to clean</p> <p>Facility gym has massive dust accumulation due to loss of recreation advisor who normally kept the gym clean</p>	<p>High exposure to mold</p> <p>Small spaces, such as housing control units increase exposure to mold because they are small, isolated and do not receive regular maintenance</p> <p>Most cleaning is done by inmates and they are not allowed to access housing control units to clean</p> <p>Mold problems contribute to sinus/health problems, especially when it grows on vents and cells, particularly seen in the segregation units</p>	<p>Irregular maintenance schedule leads to poor maintenance of HVAC system</p>	<p>Facility is an old building with poor temperature and humidity control</p> <p>Irregular temperature patterns throughout the facility – especially after administration goes home, which then AC is turned down</p> <p>Officers have no control over the AC system (only admin)</p> <p>Inmate covering of vents also contributes to irregular temperature patterns throughout the facility</p> <p>Humidity in the summer months creates moisture on the floor, and officers slip during codes</p>

Step 2: Develop Measurable Objective and Solution Activities

Major Health and Safety Objective:

Fewer officer and inmate complaints with regards to poor indoor air quality

Solution 1:	Solution 2:	Solution 3:	Solution 4:
Reinstate regular cleaning schedule at facility	Reduce presence of mold throughout facility	Increase cleaning of HVAC systems	Reduce temperature swings throughout facility
Specific Activities/ Components of Solution 1:	Specific Activities/ Components of Solution 2:	Specific Activities/ Components of Solution 3:	Specific Activities/ Components of Solution 4:
<p>Come up with vent cleaning schedule or make adjustments to pre-existing maintenance schedule</p> <p>Teach inmates how to clean vents & utilization of existing machinery (i.e., Duct-cleaning equipment)</p> <p>Increase frequency and oversight of cleaning by maintenance</p>	<p>Hire outside vendor for removal of mold</p> <p>Increase frequency and oversight of cleaning by maintenance</p>	<p>Bring outside vendor for evaluation and upgrade of HVAC system</p> <p>Recommend annual duct cleaning as part of preventative maintenance</p> <p>Recommend annual filter changes or cleaning of already existing filters</p>	<p>Keep AC running steady year around to help keep moisture out within buildings</p> <p>Give officers in Housing Control Units access to thermostats</p>

Step 3: Set Criteria for Selecting and Evaluating Interventions

<p>Scope</p> <p>Who do you want to reach (e.g. one unit or the entire organization)? How many people should be affected? (If you plan a small pilot, describe # in pilot and in long term)</p>	<p>Benefits/Effectiveness</p> <p>What are the positive outcomes you want to achieve? (both short and long term)</p>	<p>Resource Considerations</p> <p>What resources are currently available within the organization that should be considered? (e.g. time, money, personnel) Are there important parameters or context factors to consider?</p>	<p>Obstacles</p> <p>What potential barriers exist that may interfere with intervention success?</p> <p>Do not list cost as an obstacle here.</p>
<ul style="list-style-type: none"> Intervention will impact all staff and inmates (approximately 428 staff & 1371 inmates) who work and live at the correctional facility, respectively 	<p>SHORT TERM</p> <ul style="list-style-type: none"> Short term benefits include raising awareness/consciousness about importance to maintain healthy indoor air quality Creating a comfortable environment for staff and inmates Reducing incidence of slips and falls 	<ul style="list-style-type: none"> Ideally no cost and utilization of existing resources/equipment Utilizing outside resources such as industrial hygienists and department of public health's indoor air quality tool kit called Tools for Office Buildings (cost not specified) Potential cost due to hiring vendors (cost not specified) 	<ul style="list-style-type: none"> Maintenance staff is downsized and might be a challenge to change existing maintenance schedule Resistance from maintenance to want to change their existing cleaning schedule Resistance due to cost incurred from new suggested maintenance activities Fear of more work and paper work from indoor air quality activities
	<p>LONG TERM</p> <ul style="list-style-type: none"> Long term benefits include reduced presenteeism & absenteeism due to respiratory illness and cut down on inmate lawsuit due to poor indoor air quality 		
	<p>Short term examples: Increased knowledge, behavior change, participation, satisfaction</p> <p>Long term examples: Improved health, lower claims/costs, more productive</p>		

Step 4A: Form Interventions Worksheet

Major Health, Safety, & Well-Being Objective (from Step 2)

Fewer officer and inmate complaints with regards to poor indoor air quality

Key sub-issues for intervention (from Step 2 – list only the sub-issues that are addressed in interventions A, B, or C)

Intervention A Title:	Intervention B Title:	Intervention C Title:
Improve temperature control by reducing temperature swings between shifts	Improve indoor air quality through preventative maintenance activities	Improve indoor air quality through education and inmate training
Activities	Activities	Activities
<ol style="list-style-type: none"> 1. Keep air-conditioning units running steady year around to control moisture 2. Train and designate an officer at each shift in Housing Unit Control to adjust thermostat 3. Train inmates and staff about importance to not block vents in inmate cells 4. 5. 	<ol style="list-style-type: none"> 1. Create a vent cleaning schedule if a schedule does not exist 2. If a maintenance schedule exists, make adjustments to existing schedule with maintenance staff 3. Incorporate annual duct cleaning as part of preventative maintenance 4. Incorporate regular cleaning of existing filters or change filters annually 5. Create a publicly displayed maintenance log that allows staff to see how regular cleaning occurs 	<ol style="list-style-type: none"> 1. Teach inmates how to clean vents through vocational school and hire instructor 2. Utilize machinery purchased for cleaning purposes (e.g., duct cleaning equipment) 3. Increase correctional officer oversight over facility cleaning activities 4. 5.