



HONG KONG
ASIAWORLD-EXPO
亞洲國際博覽館

3RD TO 6TH
DECEMBER
2025



Implementation of sustainability strategies in Reprocessing Units for Medical Devices (RUMED) in the Latin American context

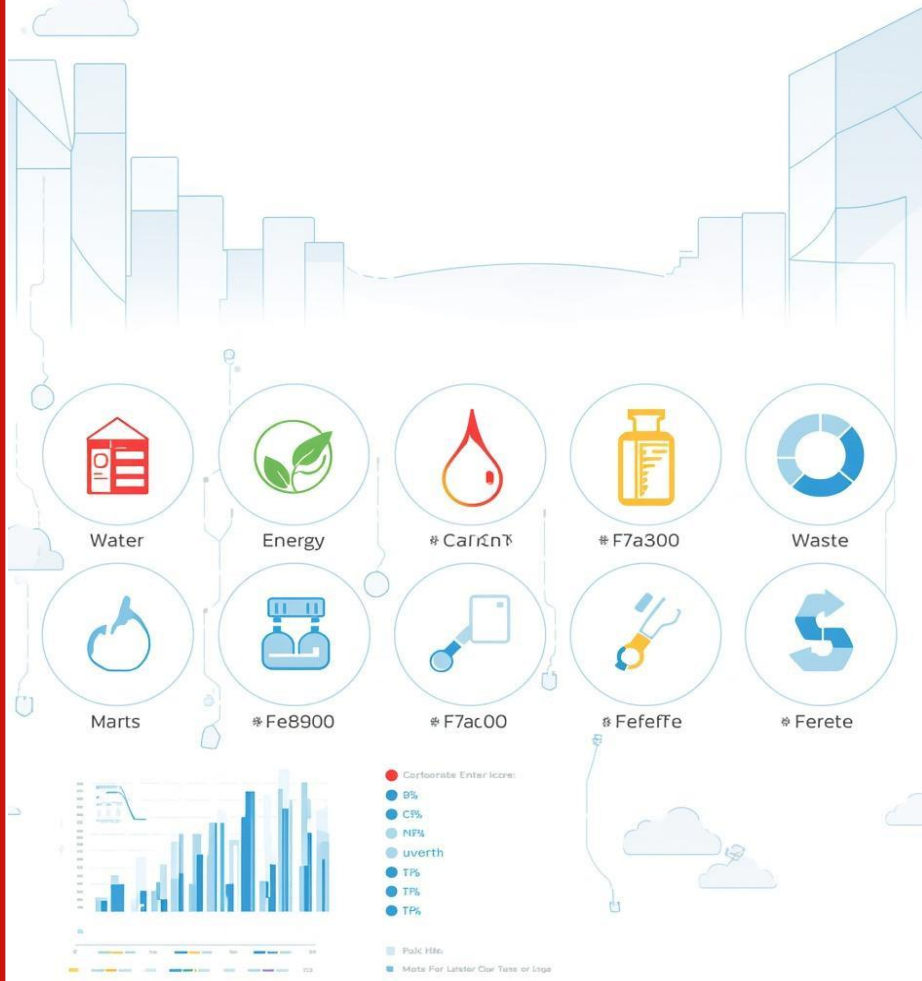
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Fundación Universitaria de Ciencias de la Salud - FUCS



PRESENTATION OVERVIEW



Context



Key Findings



Research Objectives



Discussion & Recommendations



Methodology



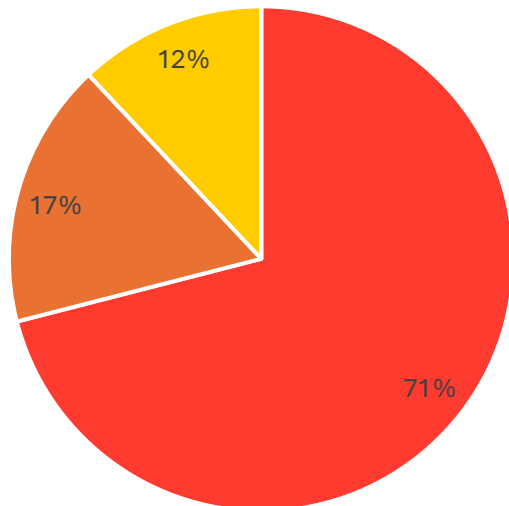
Conclusions



THE ENVIRONMENTAL CHALLENGE

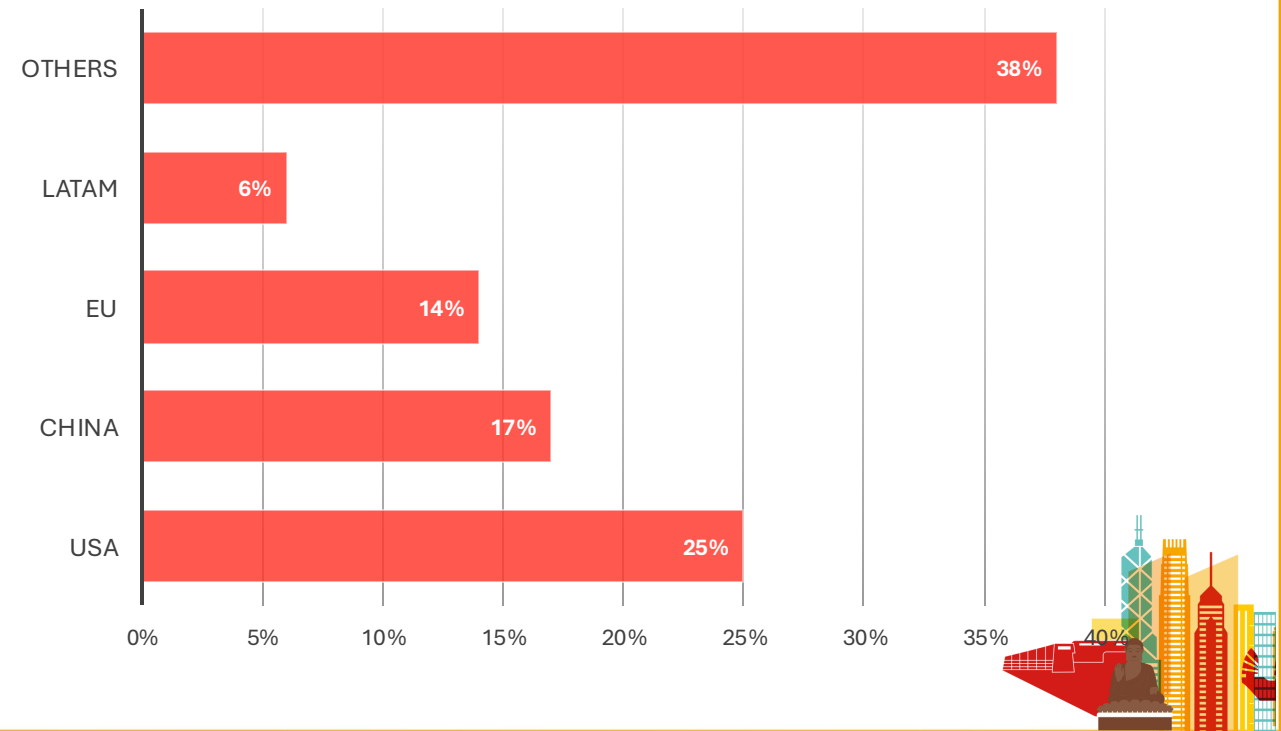
Healthcare sector: 4.4% of global emissions (2.0 Gt CO₂e annually). 5th largest emitter worldwide

EMISSIONS BY SOURCE



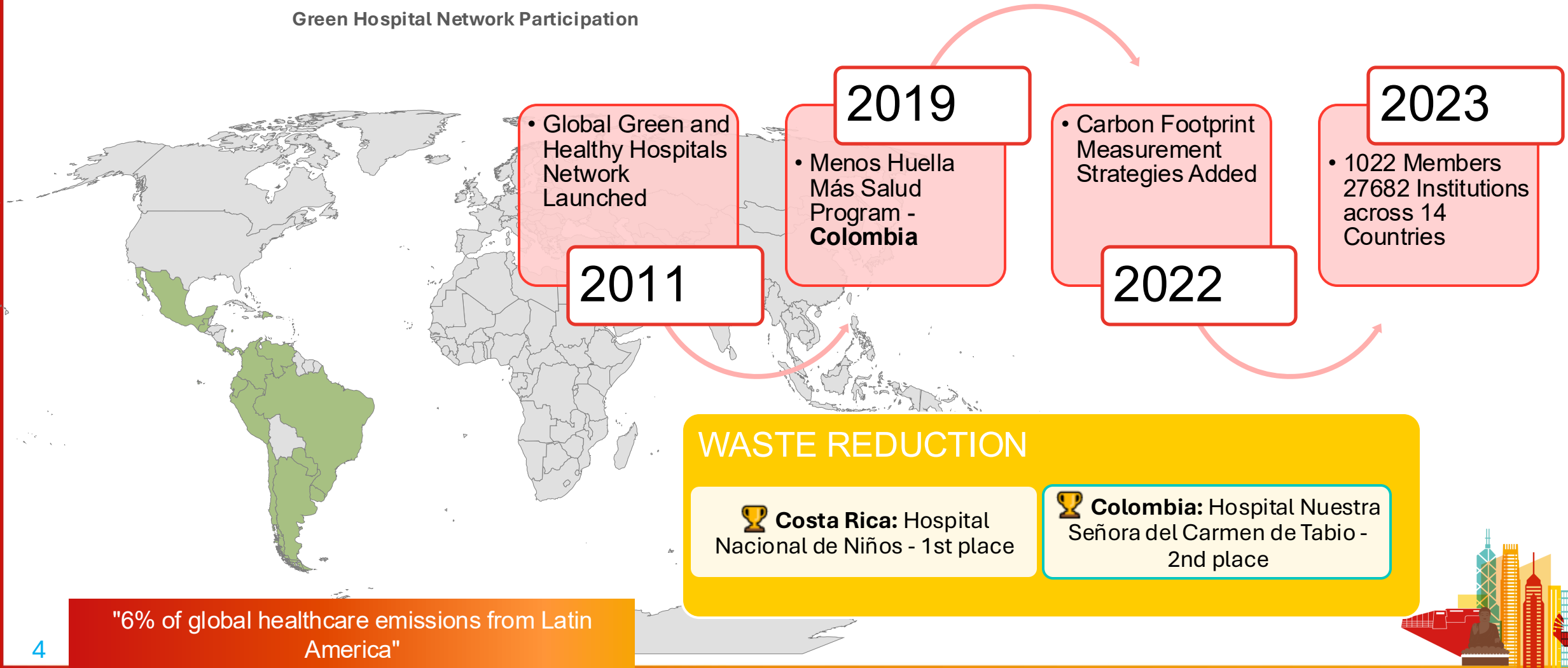
■ Supply Chain ■ Direct Operations ■ Transportation

TOP HEALTHCARE CARBON EMITTERS

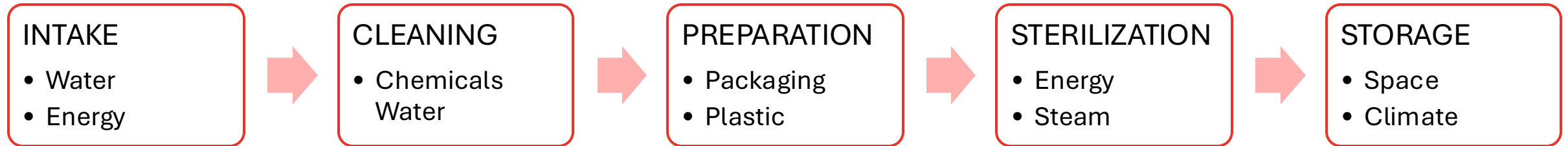


LATIN AMERICA'S SUSTAINABILITY JOURNEY

Green Hospital Network Participation



UNDERSTANDING RUMED'S ENVIRONMENTAL IMPACT



HIGH RESOURCE CONSUMPTION

Water: Cleaning, rinsing, steam generation

Energy: Autoclaves (130-200°C), steam generators

Chemicals: Detergents, disinfectants



SIGNIFICANT WASTE GENERATION

Plastic packaging materials

Paper and cardboard

Chemical containers

Disposable textiles



GHG EMISSIONS

Steam production (fossil fuels)

Electricity consumption

Transportation logistics



RESEARCH OBJECTIVE

What sustainability strategies are Latin American RUMEDs implementing to reduce their environmental footprint?

Objective



Identify sustainable development strategies and tools implemented by RUMED in healthcare institutions across Latin America

 **Water Management** - Conservation strategies

 **Energy Efficiency** - Consumption reduction

 **Waste Management** - Recycling programs

 **Impact Measurement** - Carbon footprint



RESEARCH DESIGN & SAMPLE



Study Design

- Descriptive cross-sectional
- Non-probabilistic convenience sampling
 - Voluntary participation
- Expert-validated instrument



Sample

- n = 90 RUMED leaders
 - 14 countries
- All complexity levels
- Public & private institutions

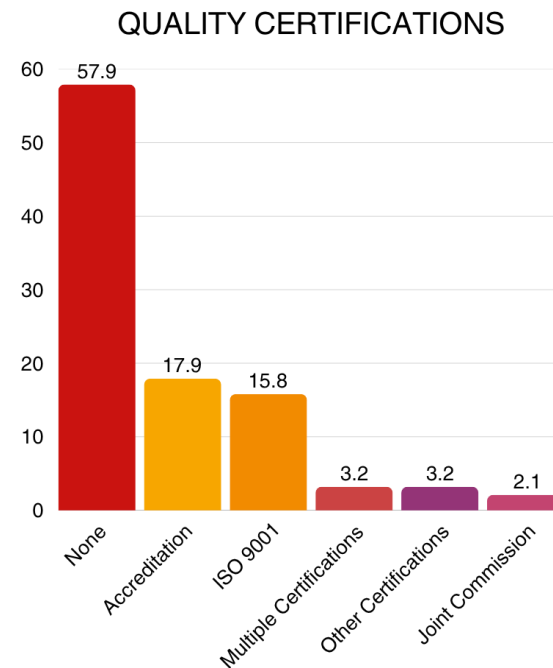
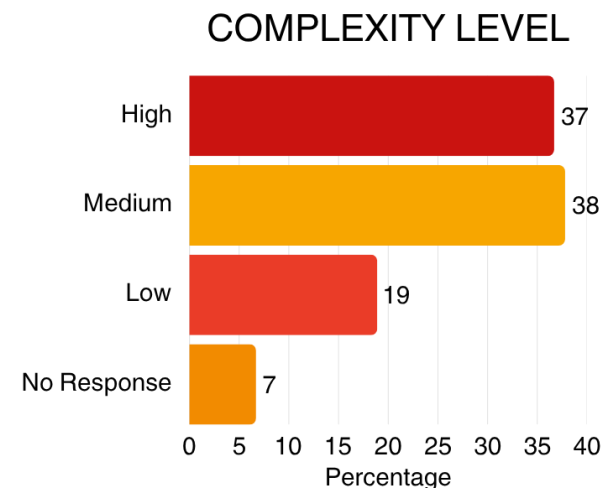
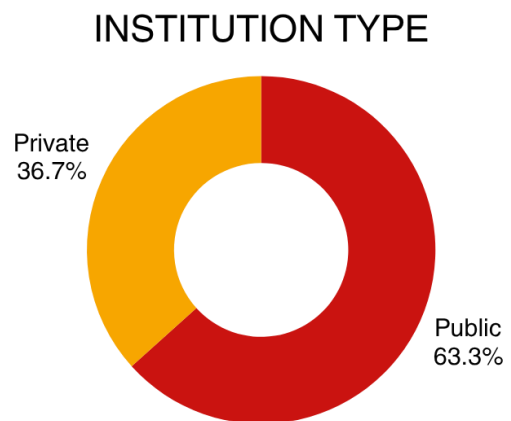
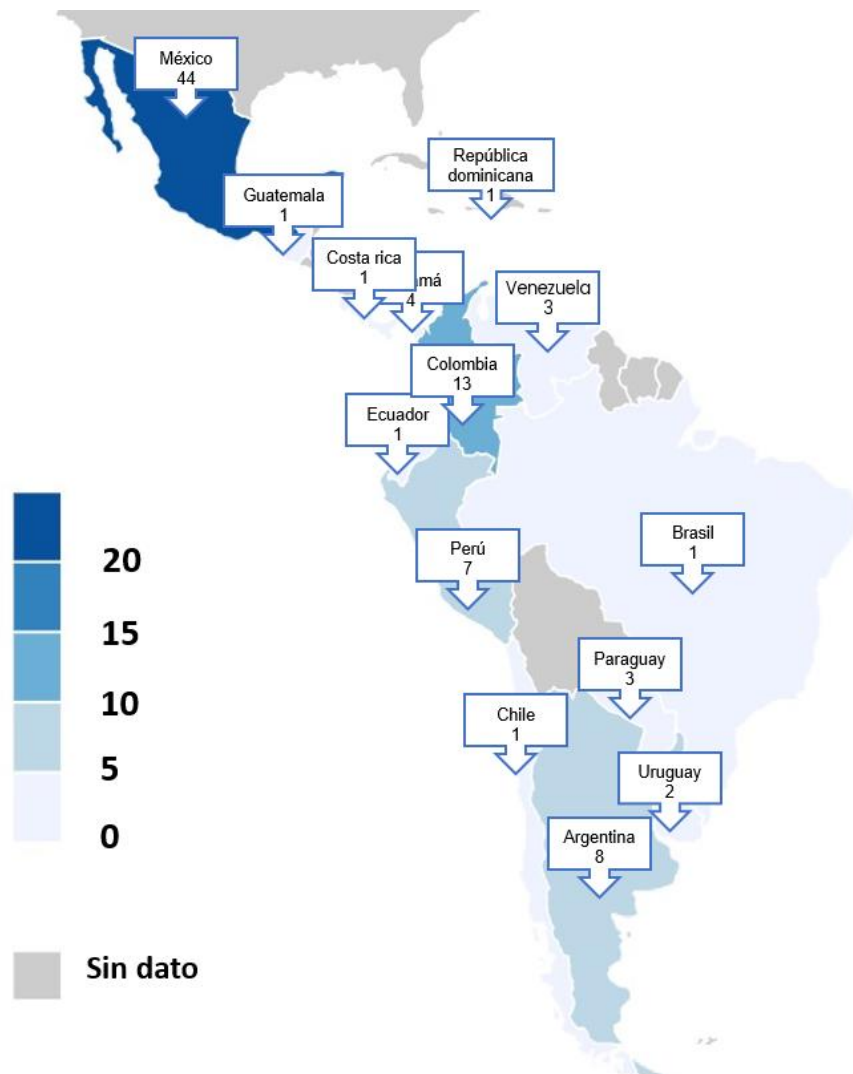


Data Collection

- Digital survey (Google Forms)
 - 49 structured questions
- Multiple choice format
 - Pilot tested
- Analyzed: Excel 2016 & Jamovi

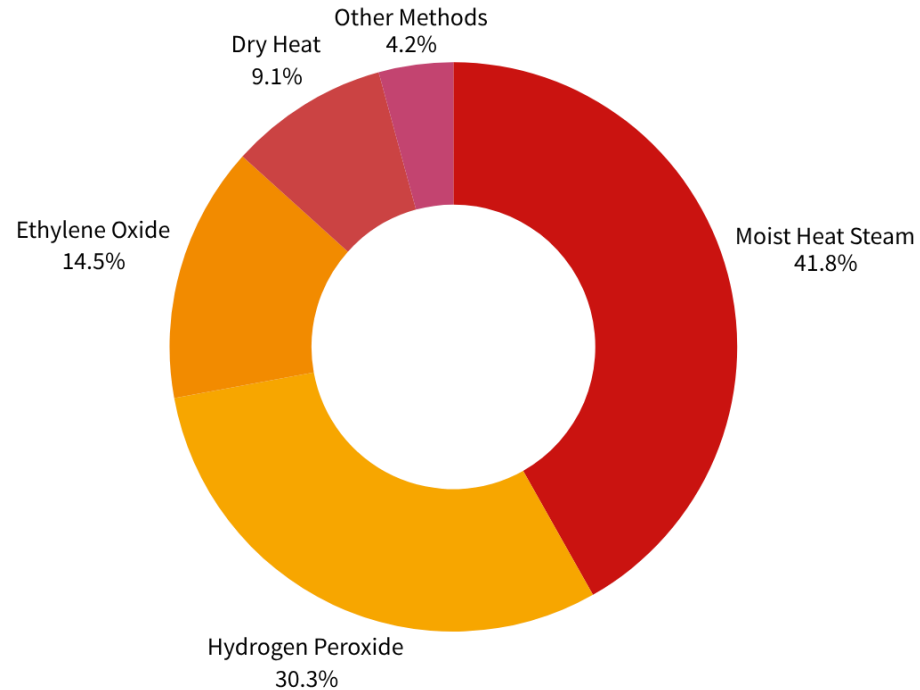


SAMPLE CHARACTERISTICS



STERILIZATION METHODS

STERILIZATION METHODS

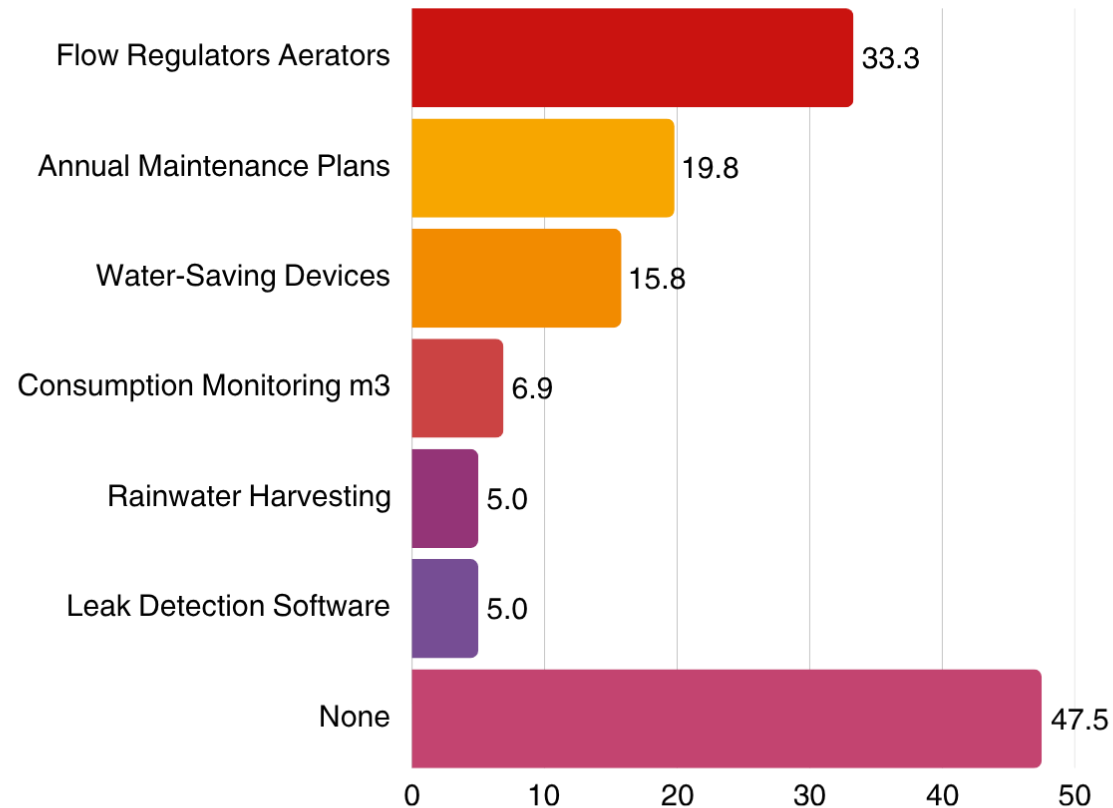


Method	Energy	Water	Environmental Impact
Steam	HIGH	HIGH	⚠️ ⚠️ ⚠️
H2O2	MEDIUM	LOW	⚠️ ⚠️
EtO	LOW	LOW	⚠️ (toxic gas)



WATER MANAGEMENT

WATER CONSERVATION STRATEGIES



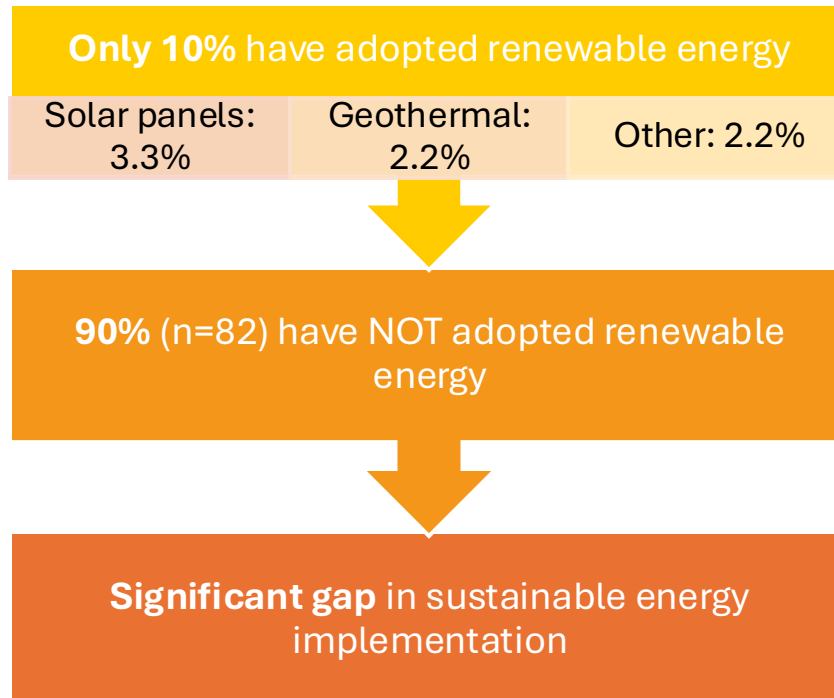
52.5% implement
water
conservation
strategies

✗ 47.5% have NO
conservation
measures

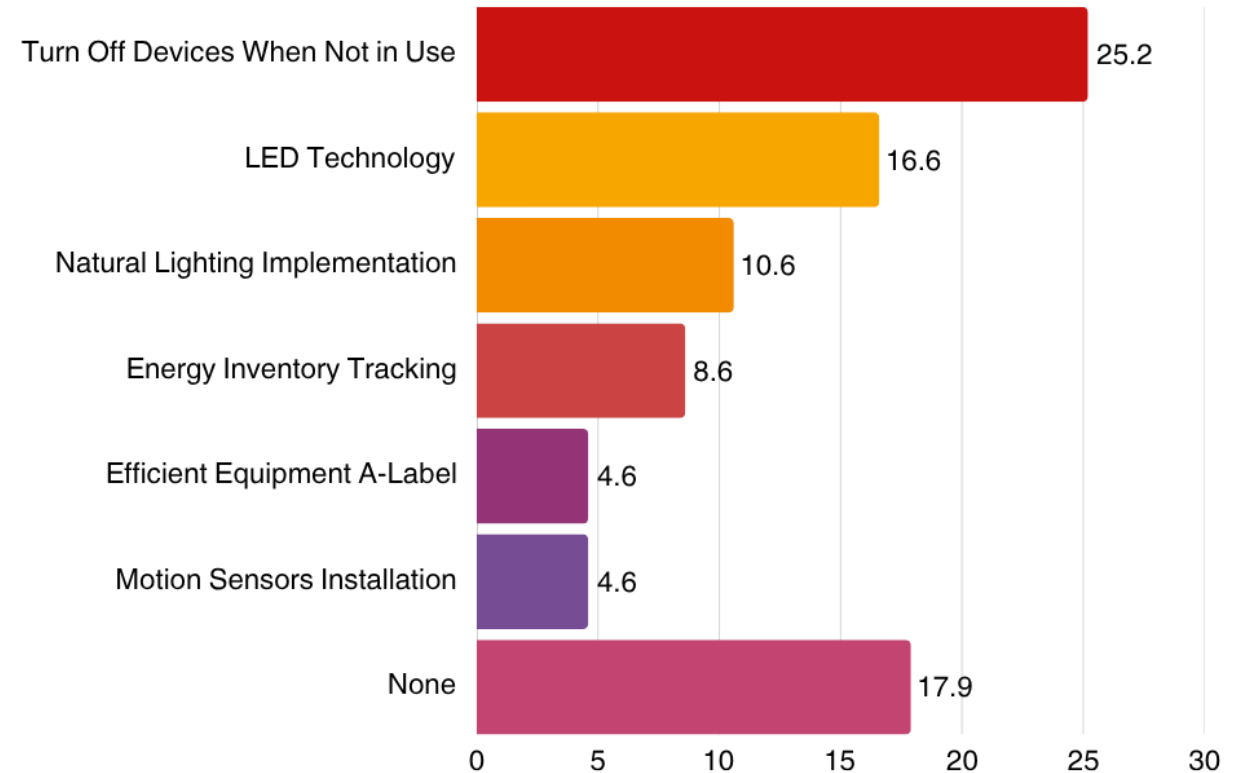
★ Colombia & Mexico: Comprehensive management ★
Panama: Rainwater recovery pioneer



ENERGY EFFICIENCY



ENERGY EFFICIENCY STRATEGIES

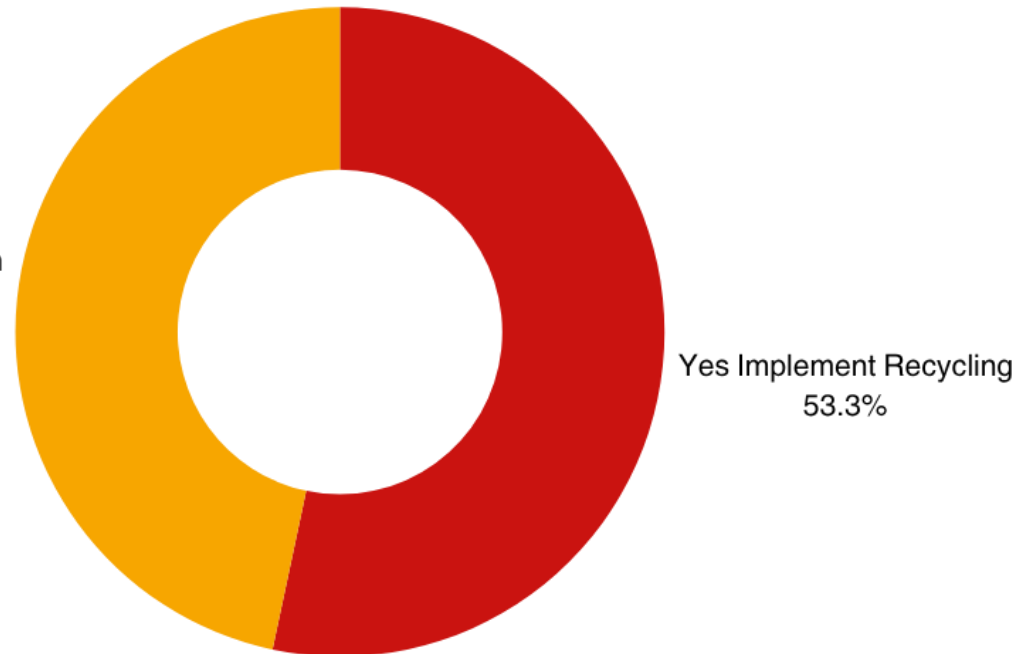


💡 Turning off sterilizers =
26% ⚡ electricity savings - 13% 💧 water savings
(McGain et al., 2016)

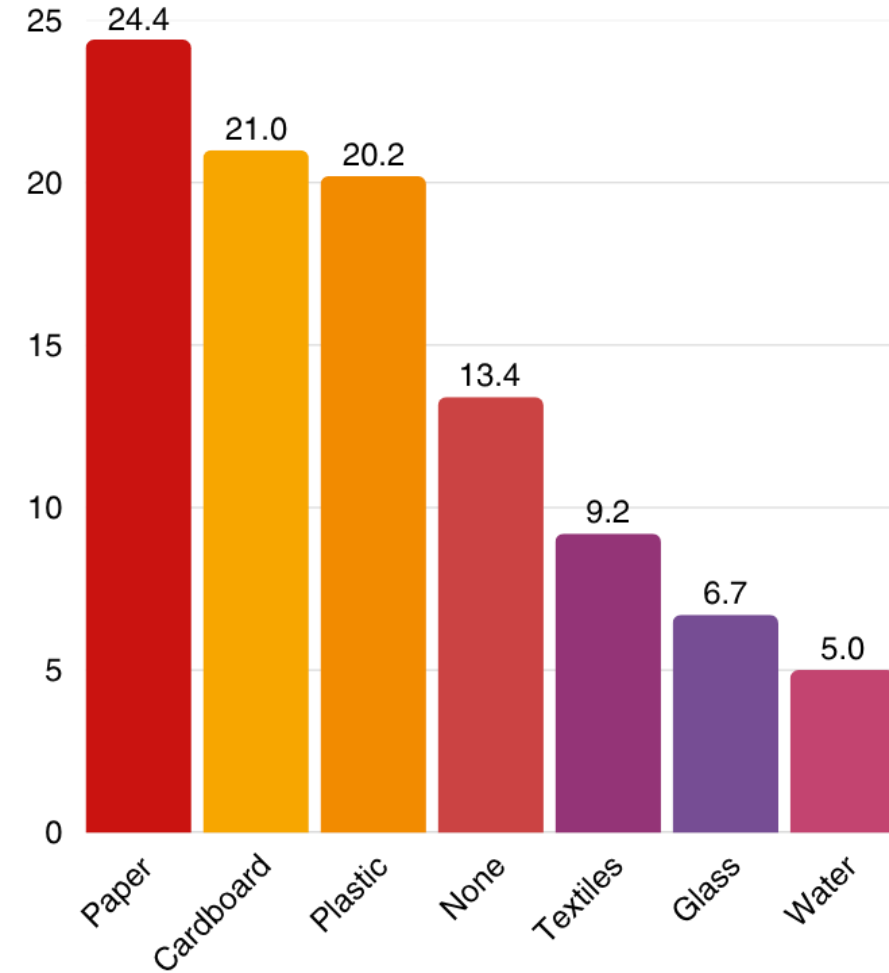


WASTE MANAGEMENT

RECYCLING PROGRAMS



MATERIALS RECYCLED



SUSTAINABLE PACKAGING

Current Packaging Practices

- **Environmental Impact of Disposable Packaging**
 - Single-use plastic wrappers: High carbon footprint
 - Paper/cardboard materials: Significant waste volume
 - Sterilization pouches: Limited recyclability

Sustainable Packaging Alternatives

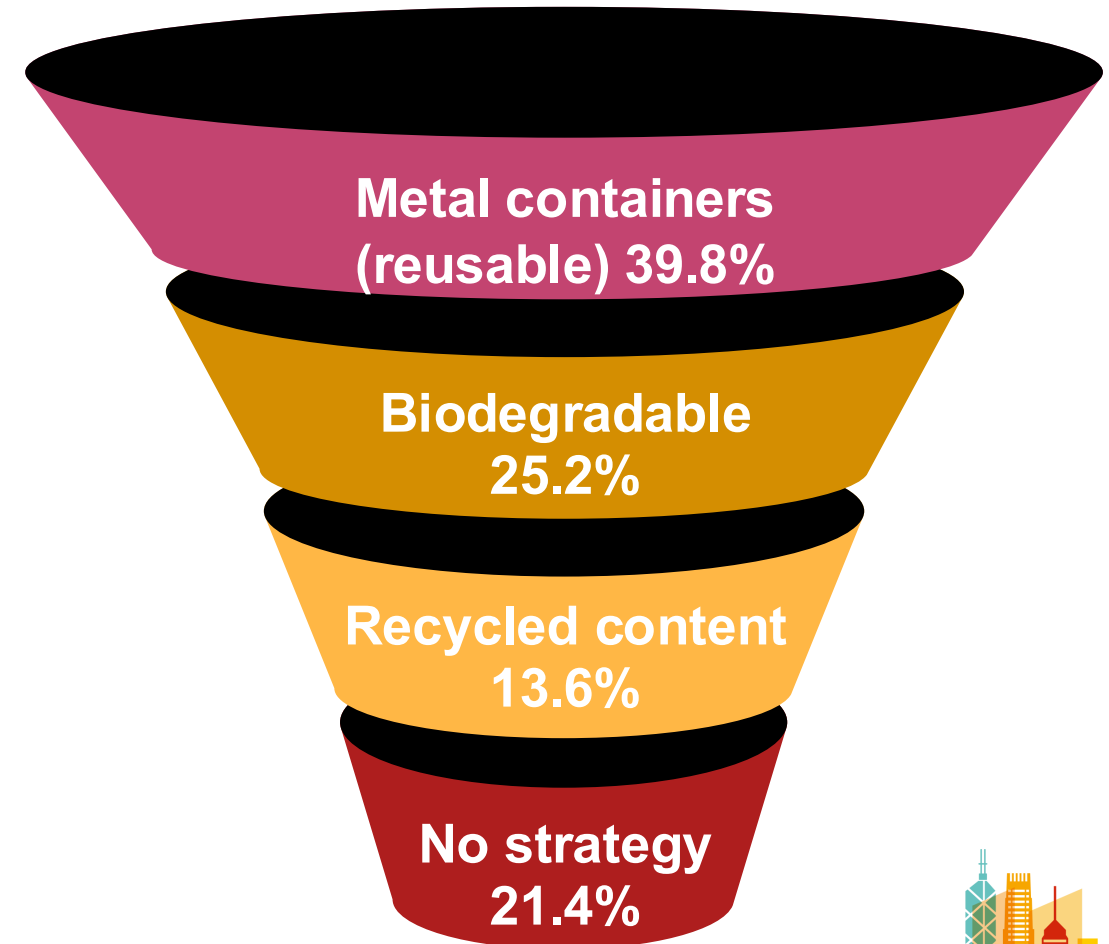
- **Reusable Options:**
- **Rigid sterilization containers**
 - Reduce waste by 95% vs disposable wraps
 - Lower long-term costs
 - Extended lifecycle (5-10 years)

Eco-Friendly Materials:

- Biodegradable wrapping materials
- Recycled content packaging
- Reduced packaging weight

Implementation Challenges in Latin America

- **✗ Barriers:**
 - Higher initial investment costs
 - Limited supplier availability
 - Regulatory compliance requirements
 - Staff training needs
- **✓ Opportunities:**
 - Long-term cost savings
 - Reduced waste disposal costs
 - Improved environmental metrics

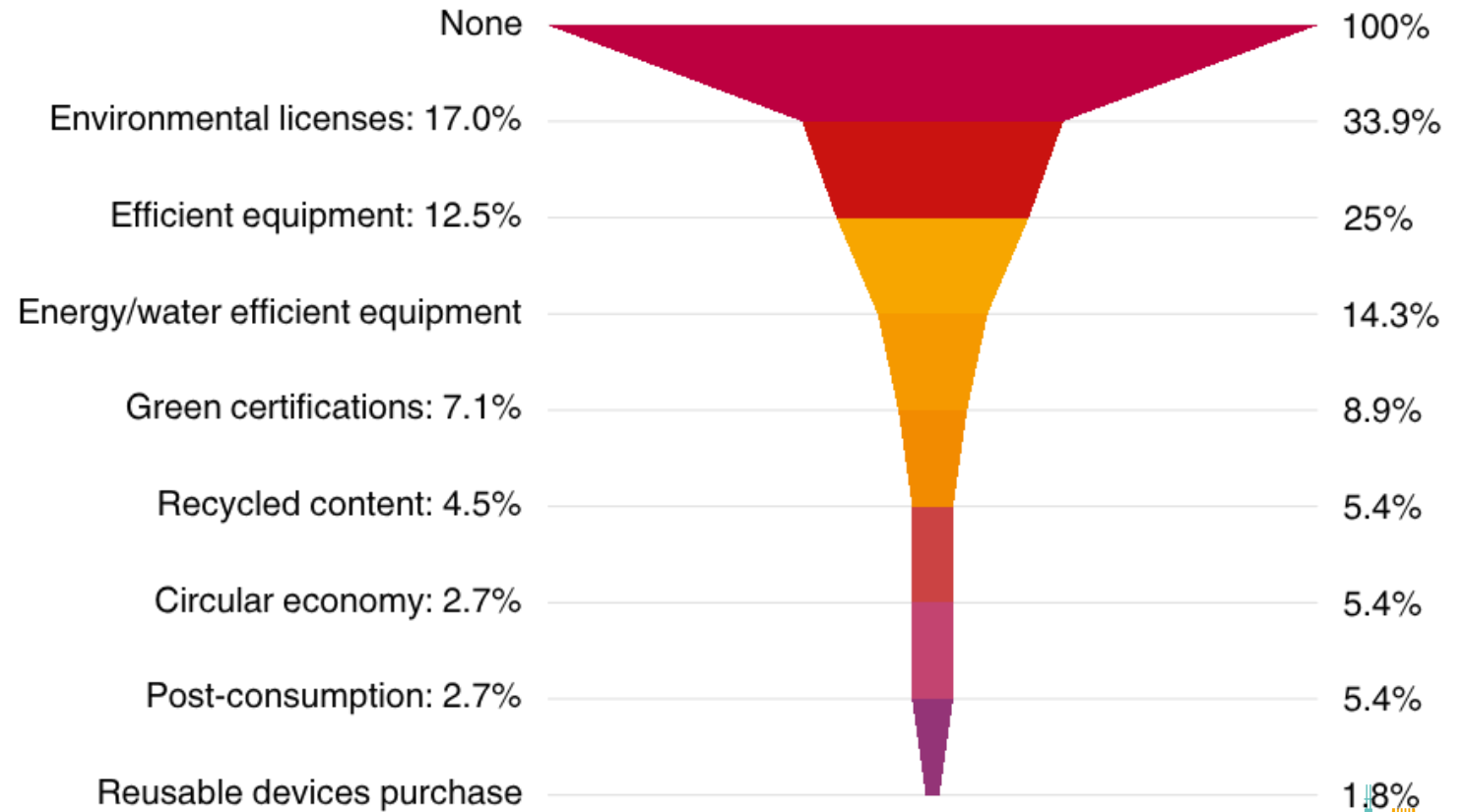


SUSTAINABLE PURCHASING

GREEN PURCHASING CRITERIA ADOPTION

CRITICAL GAP:
67% have NO
green purchasing
criterio

Only 33 %
implement ANY
criteria

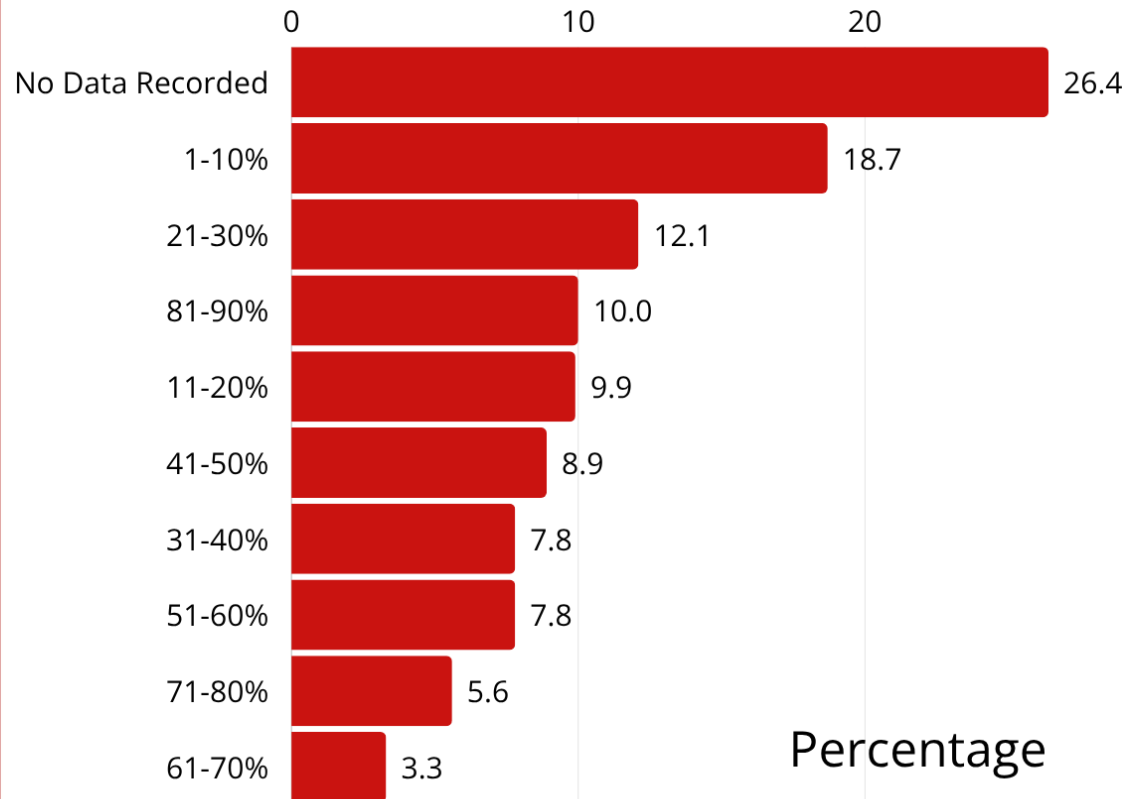


Supply chain = 71% of healthcare carbon footprint Green purchasing directly addresses this



DEVICE REPROCESSING EFFICIENCY

SINGLE-USE DEVICE REPROCESSING



Specific Challenges

Heterogeneous regulation between countries

Limited infrastructure in some institutions

Lack of regional certifying companies

Insufficient technical training

High economic pressure (favorable to reprocessing)

Opportunities

Growing environmental awareness

Create a network for sharing best practices

Potential international collaboration

Emerging local studies

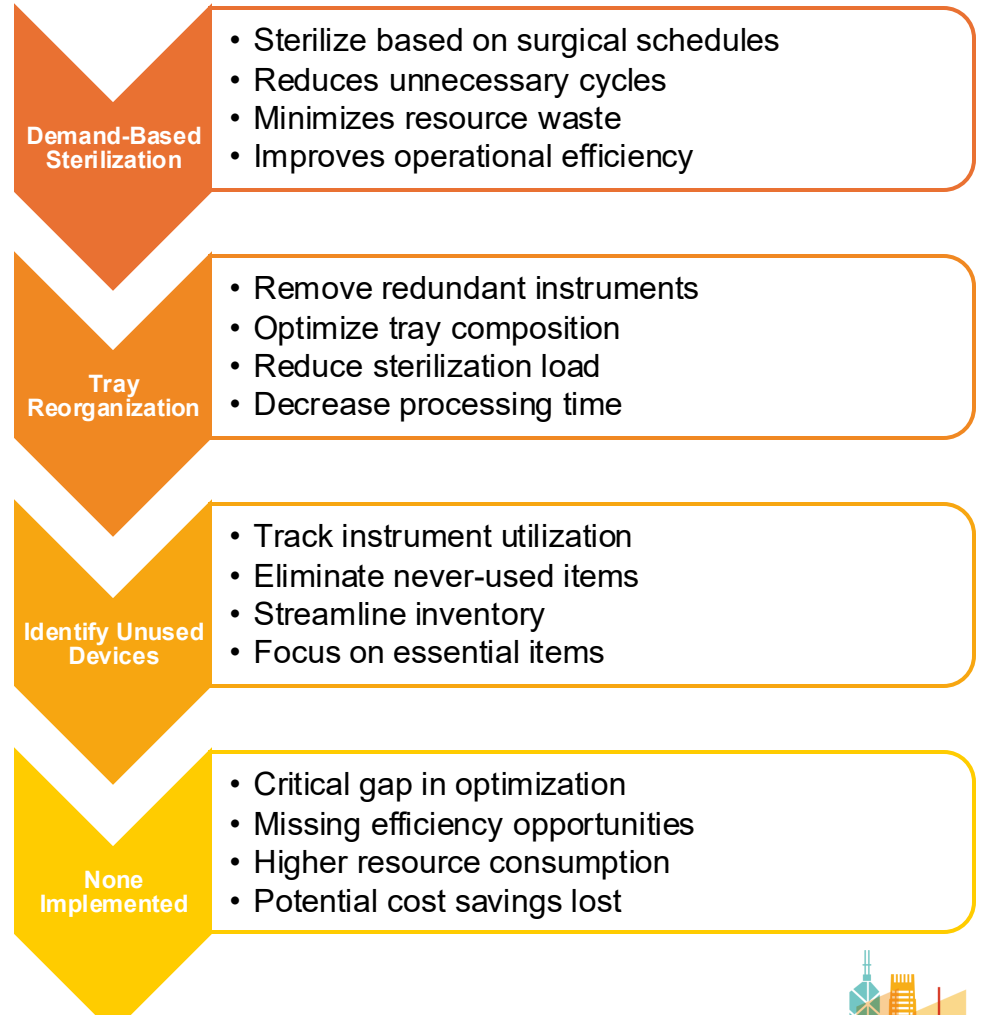
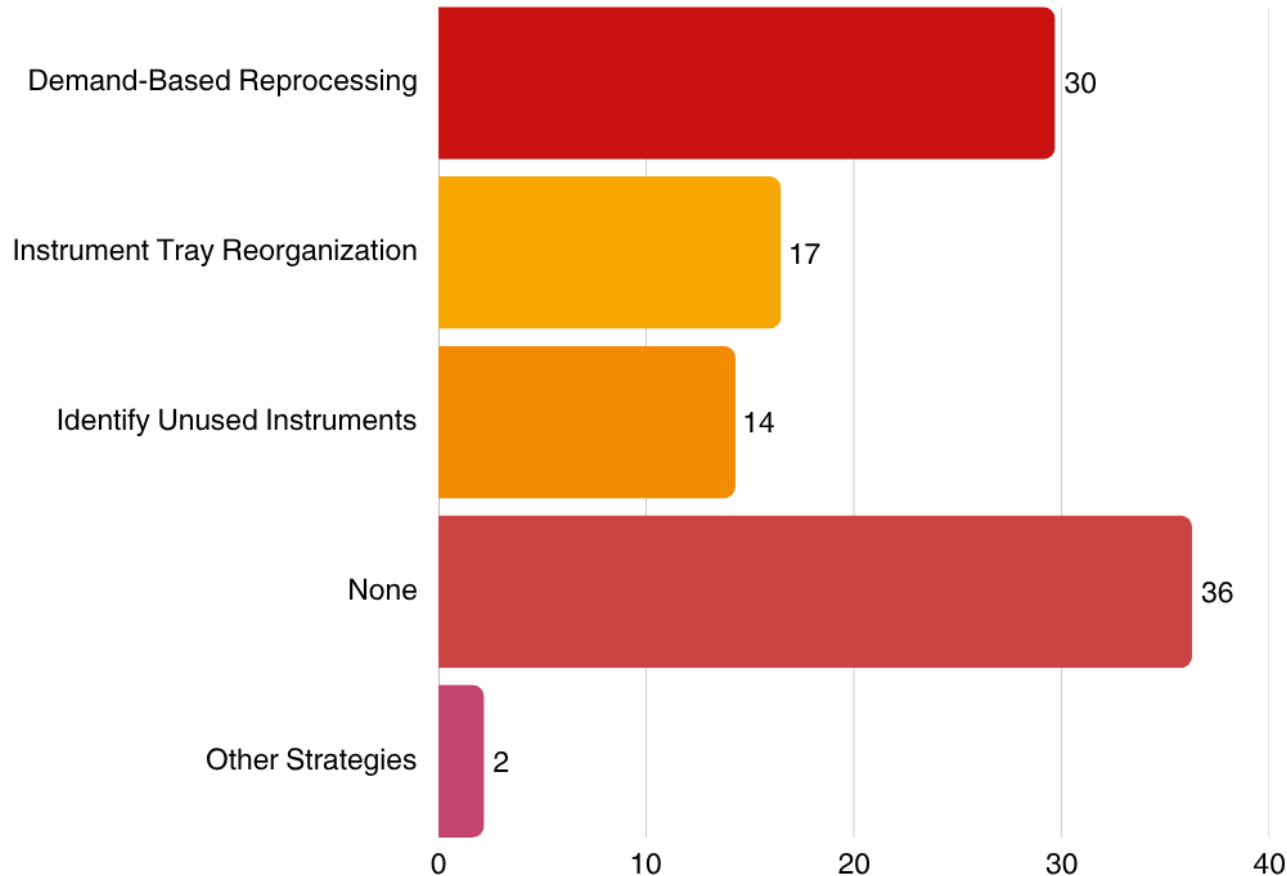
Development of regional protocols

Institutions make deliberate strategic choices about reprocessing rather than incrementally adopting the practice.



DEVICE REPROCESSING

OPTIMIZATION STRATEGIES

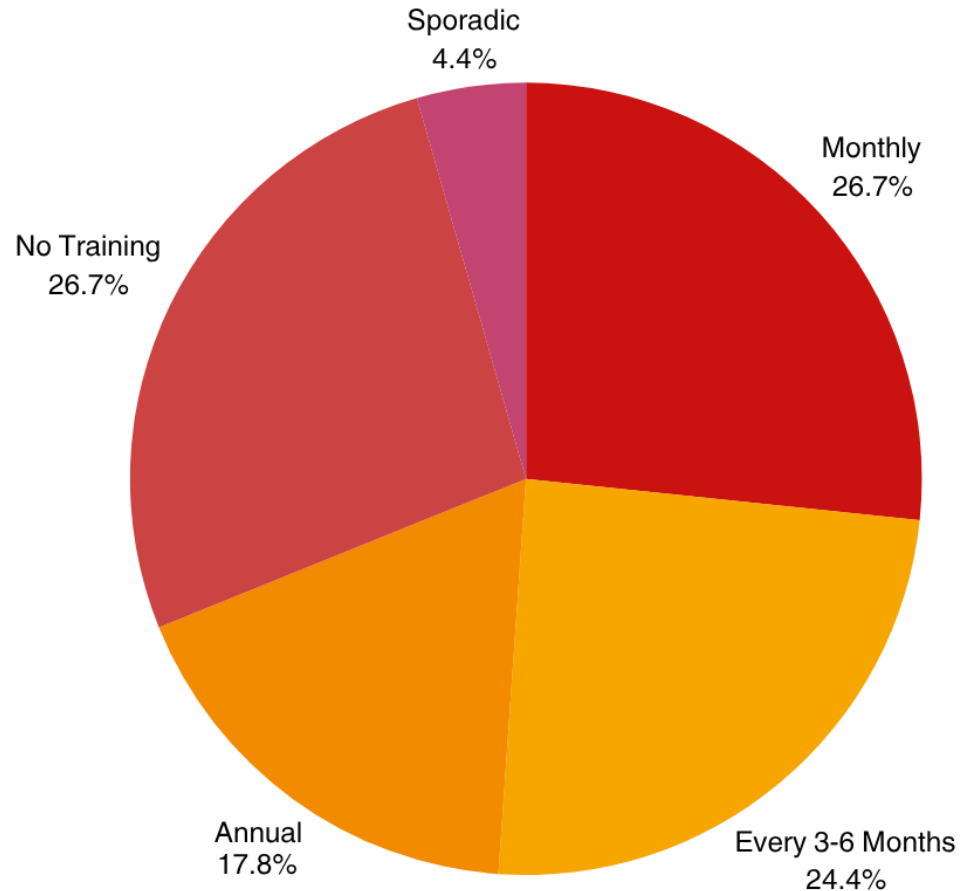


64.3% of RUMEDs implement at least one optimization strategy, but 35.7% miss opportunities to reduce environmental impact through better reprocessing practices.



TRAINING & EDUCATION

TRAINING FREQUENCY



Success Factors

- ✓ Regular frequency (monthly/quarterly)
- ✓ Hands-on practice components
- ✓ Management support and participation
- ✓ Integration with daily operations
- ✓ Follow-up and reinforcement

Barriers to Effectiveness

- ✗ Sporadic training (4.4%)
- ✗ Lack of follow-up
- ✗ No performance metrics
- ✗ Insufficient resources
- ✗ Staff turnover

Training is implemented by 73.3% of RUMEDs, but quality and frequency vary. Regular, hands-on training with management support shows best results in behavior change and sustained improvements.



INFRASTRUCTURE



Natural Lighting

- 10.6% (n=16) maximize natural light
- Reduces energy consumption
- Improves work environment quality



HVAC Systems

- High energy consumers in sterile processing
- Opportunity for efficiency improvements
- Smart climate control systems



Infrastructure Gaps

- *Key Findings:*
- 90% lack renewable energy infrastructure
- 66.7% don't have water flow regulators/aerators
- Limited automation systems
- Aging equipment in many facilities



POLICIES & CARBON FOOTPRINT

Measurement Practices: Only 20.8% (n=19) measure carbon footprint from sterilizers

By Institution Complexity Level

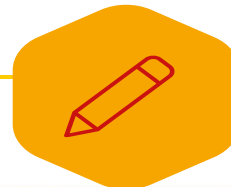
- High complexity: 6.6% (n=6) measure
- Medium complexity: 5.5% (n=5) measure
- Low complexity: 2.2% (n=2) measure
- 79.2% (n=71) DO NOT measure carbon footprint



Impact of Measurement Gap

Why This Matters:

- Cannot manage what you don't measure
- Missing baseline data for improvements
- Limited ability to track progress
- Difficulty justifying investments



Policy Recommendations

1. Develop institutional sustainability policies
2. Implement mandatory carbon footprint tracking
3. Set reduction targets and timelines
4. Integrate sustainability into quality metrics
5. Train staff on environmental impact



DISCUSSION

KEY FINDINGS



- High engagement (52-82%) but low measurement (20.8%)
- Critical gaps: 84.4% no policies, 79.2% no tracking
- Regional leaders emerging: Colombia, Mexico, Costa Rica

STRENGTHS



- 14 countries, 90 RUMEDs surveyed
- First Latin American regional assessment
- Expert-validated methodology
- Multi-dimensional evaluation

LIMITATIONS



- Self-reported data
- Cross-sectional design
- Convenience sampling
- No standardized metrics



BOTTOM LINE

First comprehensive LA assessment confirms high activity but reveals critical measurement and policy gaps.



UNITIES

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potential

fewer



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BOTTOM LINE

UNITIES

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potential

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RECOMMENDATIONS & CALL OUT



PRIORITY ACTIONS

For RUMED Leaders

1. START MEASURING - Establish baselines today
2. IMPLEMENT QUICK WINS - Turn off equipment, install regulators
3. DEVELOP POLICIES - Formalize sustainability goals

For Institutions

4. PROVIDE INFRASTRUCTURE - Measurement systems and tools
5. CREATE POLICIES - Mandates, incentives, budgets

For the Network

6. SHARE BEST PRACTICES - Regional collaboration
7. STANDARDIZE METRICS - Common measurement framework

01

02

03

CALL TO ACTION



01

Latin America proves sustainability is achievable with limited resources. High engagement exists—we need measurement systems to support it

02

START TODAY: One measurement, one change.

03

COLLABORATE: Welcomes partnerships.



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