

EVOPULSE ROBOTICS · INDUSTRY INTELLIGENCE REPORT

Service Robotics in Caribbean Healthcare

Easing the post-pandemic workforce burden, reducing hospital-acquired infections, and returning clinical time to clinical staff

Prepared for Healthcare Leadership Teams

Strategic Outlook 2026–2030

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INTELLIGENT AUTOMATION PARTNER

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Executive Summary

Caribbean health systems are managing more patients with fewer hands than at any point in recent memory. Since the COVID-19 pandemic, the staff who remain are working longer and harder — extended shifts, mandatory overtime, and a heavier non-clinical workload are now routine, and they are a documented driver of burnout, error, and attrition. At the same time, infection prevention standards have risen, and roughly seven of every hundred patients in well-resourced systems — and around ten in developing ones — still acquire an infection during their hospital stay. Service robotics addresses both pressures directly: not by replacing clinical judgment, but by absorbing the repetitive, physical, and around-the-clock work that does not require it.

This report is written for the executives and facilities leaders who must decide where to invest scarce operating budget. It sets out three operational imperatives, the clinical evidence behind each, and a focused robot portfolio — cleaning, transport, and reception models that are proven, available today, and deployable without capital expenditure under EvoPulse’s Robots-as-a-Service model.

Key indicators at a glance

<p>~7–10% Patients who acquire a healthcare-associated infection (WHO)</p>	<p>Fewer trips Staff movements through clinical zones — a transmission pathway — cut by automation</p>	<p>20%+ Caribbean nursing vacancy rate</p>
<p>\$15.8B Healthcare service-robot market by 2030 (14.2% CAGR)</p>	<p>30 days Typical EvoPulse deployment timeline</p>	<p>\$0 Upfront capital required under RaaS</p>

The three imperatives

- **Ease the post-pandemic workforce burden.** Longer hours and overtime are now structural. Automating transport and cleaning returns hours to existing staff without new hires.
- **Reduce hospital-acquired infections.** Automating transport cuts the number of staff trips through clinical zones — a known transmission pathway — while consistent robotic cleaning raises the environmental-hygiene baseline.
- **Return clinical time to clinical staff.** Lab-sample runs, medication and supply delivery, and meal transport are high-volume, fully automatable tasks that today consume trained nurses’ time.

1. The Market Context: From Surgical Suites to Hospital Corridors

Service robotics in healthcare has expanded well beyond the surgical systems most executives first associate with the term. The fastest-growing segment today is operational: robots that move medications, supplies, meals, linen, and waste through hospital corridors, and robots that clean those corridors autonomously. These systems require no integration with electronic medical records or other clinical IT, which keeps deployment risk low and time-to-value short.

The global market for healthcare service robots is projected to reach roughly \$15.8 billion by 2030, growing at about 14.2% annually, with logistics, cleaning, and delivery robots as the fastest-growing categories.

The evidence base is now mature. Leading systems — from Stanford and UCSF in the United States to Singapore’s public hospitals and multiple NHS trusts in the United Kingdom — operate autonomous delivery and cleaning fleets at scale, and the deployment frameworks are well documented.¹

\$15.8B

Healthcare service-robot market, 2030

14.2%

Projected market CAGR, 2024–2030

Mature

Documented deployments across US, UK, Asia

¹Market framing: Vynz Research (2024) healthcare service-robot market sizing. Documented deployments: publicly reported programs at Stanford Health Care, UCSF Medical Center, Singapore public hospitals, and NHS trusts.

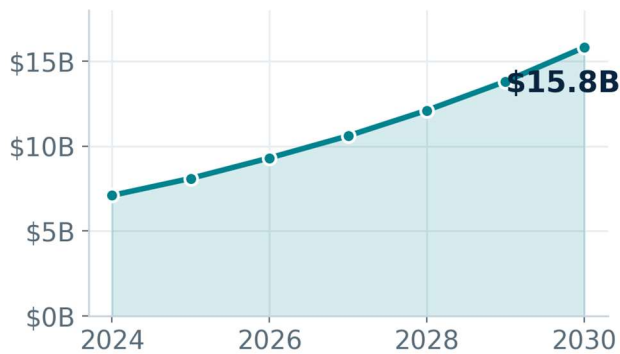
2. Strategic Outlook: 2026–2030

Two forces define the 2026–2030 window for hospital leaders: a robotics capability that is scaling fast and falling in cost, and a demand-and-workforce gap that is widening at the same time. The charts below frame both. Together they explain why the next five years are the decision window — the hospitals that build automation into operations early will enter the 2030s with a structural cost, infection, and staffing advantage over those that wait.

2.1 Where the technology is heading

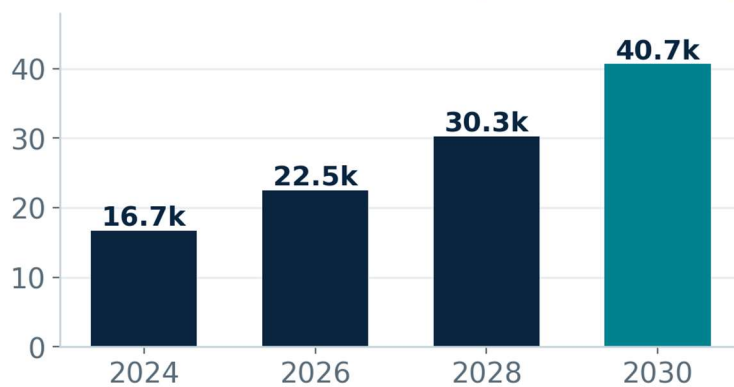
The healthcare service-robot market is on track to more than double this decade, and unit volumes are climbing even faster as prices fall and Robots-as-a-Service lowers the barrier to entry. Logistics and cleaning robots — the categories at the center of this report — are the fastest-growing segments.

Healthcare service-robot market size, 2024-2030E (US\$ billions)



Source: Vynz Research (14.2% CAGR). Broader medical-service-robot estimates reach ~\$52B by 2030 (Grand View).

Medical robot unit sales, 2024-2030E (thousands of units)

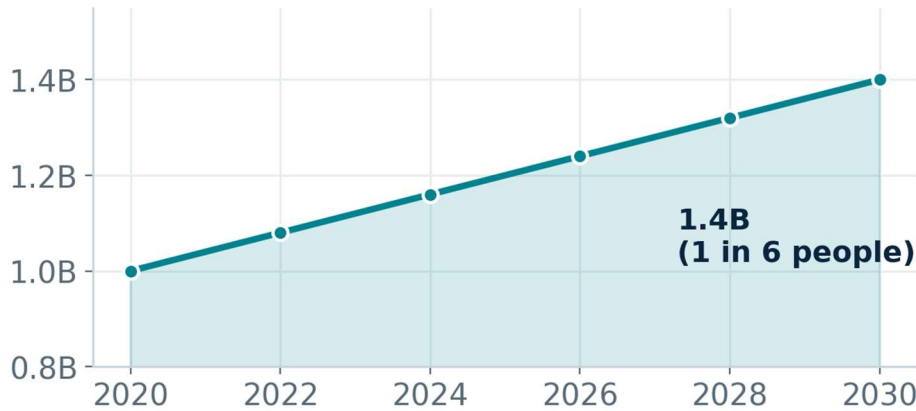


2024 actual: 16,700 units, +91% YoY (IFR World Robotics 2025). 2030 projected at ~16% CAGR (illustrative).

2.2 The demand pressure behind it

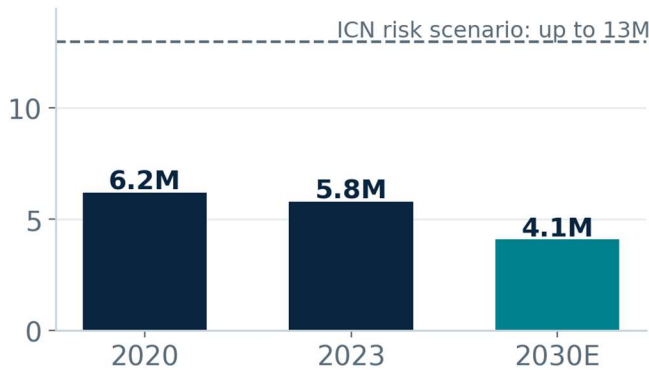
On the other side of the ledger, demand is rising while the workforce strains to keep pace. The global population aged 60 and over grows from 1.0 to 1.4 billion between 2020 and 2030, driving more admissions and longer stays. The global nursing shortage is projected to narrow in aggregate, but it remains concentrated in lower-income regions — exactly where the Caribbean sits — and bodies such as the ICN warn the gap could be far larger without action.

Global population aged 60+, 2020-2030 (billions)



Source: WHO. Older patients are admitted more often, stay longer, and need more hands-on care.

Global nursing workforce shortage, 2020-2030E (millions)



WHO baseline narrows globally but stays concentrated in lower-income regions; 6M new nurses needed by 2030.

2.3 The 2026–2030 adoption curve

For an individual hospital, the strategic value of acting is highest at the start of this window and erodes as automation shifts from differentiator to baseline expectation.

Phase	What happens in the market	What early adopters gain
2026	Service robotics shifts from pilot to standard practice across leading global health systems; RaaS makes entry capital-free.	Early pricing, first-mover operational learning, and visible quick wins on lab and pharmacy logistics.
2027–2028	Accreditation and rating bodies begin factoring automation and infection-control capacity into hospital assessments.	Documented infection and efficiency gains become an accreditation and reputation advantage.
2029–2030	Robot-assisted hospitals demonstrate measurably better infection rates, throughput, and staff retention.	A structural cost-per-encounter and staffing advantage; the gap to non-adopters becomes a competitive barrier.

Chart sources: Vynz Research and Grand View Research (market); IFR World Robotics 2025 (unit sales); WHO (ageing and nursing workforce); ICN (risk scenario). Forward values to 2030 are estimates.

3. Three Operational Imperatives

3.1 Easing the Post-Pandemic Workforce Burden

WORKFORCE INTELLIGENCE

The pandemic permanently changed how hospital staff work. Peer-reviewed studies document that healthcare workers faced longer working hours, redeployment, and rising patient-to-staff ratios during and after COVID-19, and that these conditions persist as a structural staffing shortfall rather than a temporary surge.²

The consequences are well established. Increased overtime is an independent risk factor for nurse burnout. Shifts longer than twelve hours, and weeks exceeding forty hours, are associated with significantly higher rates of error — needlestick injuries and medication errors are roughly 28% more common among nurses working more than forty hours per week.³ Because hospitals now report needing two to three months to replace a single registered nurse, the units left short-staffed in the interim lean even harder on overtime — a self-reinforcing cycle.

Robotics does not solve the staffing shortage by adding clinicians. It eases the burden on the clinicians who remain — by removing the non-clinical, physically demanding, around-the-clock tasks that lengthen shifts and accelerate burnout. Every supply run a robot completes is time a nurse does not spend away from the bedside, and a shift that ends closer to on time.

Longer

Post-COVID shift length & overtime, now structural

+28%

Errors among nurses working 40+ hrs/week

2–3 mo.

Time to replace one registered nurse

²“The Impact of the COVID-19 Pandemic on Nurses’ and Junior Doctors’ Workloads,” PMC; longitudinal study on overtime/night shifts and burnout among nurses, PMC (2024).

³Working hours and patient safety: Health Affairs, “The Working Hours of Hospital Staff Nurses and Patient Safety”; “Increased Utilization of Overtime and Agency Nurses and Patient Safety,” PMC (2024).

3.2 Reducing Infections by Reducing Movement

INFECTION PREVENTION

Healthcare-associated infections (HAIs) remain one of the most common adverse events in care delivery. The World Health Organization estimates that, at any given time, about 7 of every 100 hospitalized patients in developed countries and 10 of every 100 in developing countries will acquire at least one HAI, with the highest risk in intensive care units.⁴ For Caribbean systems, the developing-country burden is the relevant benchmark.

One of the most under-managed transmission pathways is people and the things they carry. Every time a nurse or orderly walks a specimen, a meal tray, a medication, or a linen cart through a ward, they move between contaminated and clean areas — and hands, uniforms, and cart surfaces become vectors for pathogens such as MRSA, VRE, and *C. difficile*. The more human trips through clinical corridors, the more opportunities for cross-contamination.⁵

Autonomous transport breaks that chain. A delivery robot follows a fixed, wipe-clean route, carries items in closed compartments, and does not move from patient to patient between stops. Replacing dozens of daily human trips with robot runs removes a large share of the contact and movement through which infection spreads — without asking already-stretched staff to do anything differently.

Robotic cleaning reinforces the effect. Running consistent mopping, scrubbing, and vacuuming passes to the same standard every time — with timestamped logs — raises the baseline of environmental hygiene that manual cleaning cannot guarantee under staffing pressure, and gives accreditation bodies the documented coverage they increasingly expect.

7 / 10

Per 100 patients acquiring an HAI
(developed / developing)

Fewer vectors

Human trips and hand-offs through wards
replaced by robot runs

Consistent

Logged cleaning coverage to the same
standard every pass

⁴World Health Organization, burden of health care-associated infection (≈ 7 per 100 patients in developed, ≈ 10 per 100 in developing countries); WHO Guidelines on Core Components of IPC.

⁵Transmission via the hands of health workers and contaminated environmental surfaces and equipment is well documented: WHO Guidelines on Hand Hygiene in Health Care; CDC guidance on contact transmission and environmental cleaning in healthcare settings.

3.3 Returning Clinical Time to Clinical Staff

OPERATIONAL EFFICIENCY

A meaningful share of nursing and orderly time is consumed by tasks that require no clinical training at all: walking lab samples to the laboratory, collecting medications from the pharmacy, ferrying supplies and equipment between floors, delivering meals, and moving clean and soiled linen. International hospital studies consistently find that these logistics tasks absorb hours of each clinical shift — time subtracted from direct patient care.

These are precisely the tasks robots perform best: high-volume, repetitive, predictable, and safety-critical only in the sense that they must be reliable. A delivery robot carrying lab specimens in a locked compartment does not get pulled away to answer a call light; it completes the run every time, day or night, and logs it. Reassigning this work from people to machines is not a reduction in headcount — it is a reallocation of scarce, expensive human capacity back to the bedside, where it was trained to be.

Caribbean health systems cannot recruit their way out of the workforce crisis. The most efficient lever available is operational: automate the work that does not require clinical judgment, and give that time back to the people who do. — Pablo Carmona, EvoPulse Robotics

4. Clinical Evidence: Robots Improving Outcomes and Operations

The case for hospital service robotics rests on real deployments, not projections. The examples below are drawn from publicly documented programs at major health systems and illustrate the three imperatives in practice.

Institution	Deployment	Documented outcome
Stanford Health Care United States	Autonomous logistics robots (Aethon TUG and similar) for supply, lab, and pharmaceutical delivery across hospital corridors.	A well-documented reference architecture for hospital robot integration; sustained automation of inter-department delivery.
UCSF Medical Center United States	Building-wide autonomous delivery fleet operating across multiple floors with cloud elevator integration.	Handles 800+ deliveries per day across 12 floors with high on-time reliability, offloading routine transport from clinical staff.
Singapore public hospitals Singapore	Autonomous cleaning and disinfection robots deployed across clinical and non-clinical zones within a national health framework.	Demonstrated environmental disinfection at scale; cleaning staff redeployed toward higher-risk areas such as ICU and isolation.
NHS trusts United Kingdom	Delivery robots handling linen, waste, and pharmacy deliveries in hospital pilots, with further trusts in procurement.	Hundreds of deliveries per day automated; nursing time on logistics sharply reduced and staff reporting lower physical fatigue.
Netherlands care facilities Netherlands	Pudu Robotics service robots deployed across hospitals and care facilities for internal transport and cleaning.	Demonstrates European healthcare adoption of the same Pudu platforms EvoPulse offers, easing logistics and cleaning workload for care staff.

Figures reflect publicly reported program results and vary by facility, scope, and measurement method.

5. Recommended Pudu Robotics Portfolio

EvoPulse recommends a focused portfolio matched to the three imperatives. As the exclusive Caribbean partner of Pudu Robotics, EvoPulse deploys and supports each model on-island. The portfolio spans three functions — cleaning, internal transport, and reception — so a single program can address infection control, workforce burden, and patient experience at once.

5.1 Cleaning

Model	Role	Key specifications	Best fit
CC1	Indoor cleaning (mop / scrub / vacuum)	Four-in-one sweep / scrub / vacuum / wash; up to 17,000 Pa suction; 15 L clean and 17 L waste tanks with auto fill and drain; ~8-hour battery; visual + laser SLAM navigation with 99% obstacle-avoidance accuracy; optional elevator integration for autonomous multi-floor cleaning.	Clinical corridors, wards, and ward bathrooms — continuous, logged overnight cleaning across multiple floors.
MT1	Large-area sweeping	Dual disc brushes for coarse and fine debris; 70 cm cleaning width; 35 L bin; AI real-time waste recognition; ~8-hour battery with fast charge for 24/7 operation; covers very large floor areas.	Lobbies, atria, concourses, car parks, and outpatient halls.

Together, CC1 maintains the high-touch clinical zones to a consistent, auditable standard, while MT1 keeps large public areas presentable without consuming environmental-services labor.

5.2 Internal Transport & Delivery

Model	Role	Key specifications	Best fit
FlashBot	Multi-floor secure delivery	Autonomous last-meter delivery with cloud elevator integration (no hardware modification); 2–4 secure, digitally locked compartments; ~20 kg payload; ~9-hour runtime; VSLAM+ navigation.	Medications, lab specimens, blood products, documents — point-to-point across floors.
T300	Heavy internal logistics AMR	Up to 300 kg payload; VSLAM+ and LiDAR navigation; multi-floor operation via cloud elevator integration; detects low/suspended obstacles and floor safety markings; up to 12-hour battery with auto-recharge for 24/7 use.	Supply carts, central-stores runs, clean linen, and waste transport across floors.
T600	Maximum-payload AMR	Up to 600 kg payload; multi-floor operation via cloud elevator integration; 12-hour battery with ~2-hour fast charge; underdrive / cart-tug configurations for bulk movement.	Bulk linen, pharmacy bulk stock, and central-supply distribution across floors at large hospitals.

Choose T300 for general ward and supply logistics; step up to T600 where payloads or distances are large enough that delivery frequency itself becomes the constraint.

5.3 Reception & Wayfinding

Model	Role	Key specifications	Best fit
BellaBot	Entrance greeting & information	Interactive greeting mode with expressive display, multilingual voice interaction (supports multiple languages), and gesture recognition; multi-floor navigation with elevator integration; can also carry light items between departments.	Main-entrance reception, visitor welcome, multilingual wayfinding, and queue / information support.

At the entrance, BellaBot greets and orients visitors, answers routine questions, and points the way — and its multilingual voice is a natural fit for the Caribbean’s mix of English-, Spanish-, Dutch-, and French-speaking patients and visitors, softening first impressions and freeing front-desk staff during peak arrival periods.

6. The Caribbean Context: A System Under Structural Stress

The three imperatives are sharper in the Caribbean than almost anywhere. Healthcare-worker emigration is accelerating: trained nurses routinely leave for Canada, the United Kingdom, and the United States, where salaries are three to five times higher. Vacancy rates across the region now exceed 20% for nursing staff, and infection-control expectations continue to rise post-pandemic.

The most important structural driver, however, is demographic. The Caribbean's population is aging rapidly, and older patients are admitted more often, stay longer, and require more hands-on care. Patient volumes are projected to rise by roughly 22% by 2030 — demand that will keep climbing even as the workforce shrinks. A shortage that is already acute today becomes untenable as the aging curve steepens.

The resources to simply hire more staff do not exist. The realistic path is operational efficiency — doing more with the human capacity already in place by automating the tasks that do not require clinical judgment. Robotic cleaning, transport, and reception are exactly those tasks: high-volume, repetitive, and fully automatable with technology available today.

20%+

Regional nursing vacancy rate

3–5×

Salary gap vs. US / Canada driving emigration

+22%

Projected rise in patient volume by 2030 as the population ages

7. Commercial Model and Financial Snapshot

For budget-constrained health systems, how a capability is acquired matters as much as the capability itself. EvoPulse offers Robots-as-a-Service (RaaS): a fixed monthly operating fee with no capital appropriation, no depreciation, and no in-house maintenance burden. Maintenance, software upgrades, and on-island support are included, and deployment typically completes within 30 days — bypassing the 12–18-month procurement cycles that ownership usually entails.

Consideration	Traditional ownership	EvoPulse RaaS
Upfront cost	\$25,000–\$45,000 per robot	\$0 — no capital appropriation
Budget treatment	Multi-year depreciation; capital impact	Predictable monthly operating fee
Maintenance	In-house engineering maintenance burden	Fully included
Technology refresh	Hospital bears obsolescence cost	Upgrades / replacement at lease expiration
Time to deploy	12–18-month procurement cycle	Live in ~30 days
Support	Vendor-dependent, often off-island	Caribbean on-island response within 24h

Illustrative scenario — 200-bed hospital

A 200-bed Caribbean hospital deploys four service robots under RaaS. With an estimated fee of roughly \$4,000 per month and approximately four full-time-equivalents of non-clinical labor reallocated (at about \$1,800 base plus a 35% employer burden, ~\$9,720/month), the net monthly benefit is on the order of \$5,720 — before counting the harder-to-price gains in infection control, reduced overtime, and staff retention.⁶

~\$4,000

Est. monthly RaaS fee, 4 robots (illustrative)

~\$9,720

Monthly value of reallocated labor

~\$5,720

Net monthly benefit, before quality gains

Illustrative only. Final pricing is subject to a facility assessment of layout, volumes, and service scope.

⁶Illustrative financial scenario for explanatory purposes only; not a quotation. Actual pricing and savings depend on a facility assessment.

8. From Decision to Live Deployment in 30 Days

Phase	What happens	Output
1. Assessment Days 1–7	EvoPulse conducts an engineering safety review and operational walkthrough, maps navigation corridors, and identifies infection-control integration points. No cost, no commitment.	Custom ROI model calibrated to your bed count, roster, and volumes.
2. Integration & training Days 8–25	Robots are configured to your floor layout and Wi-Fi; cloud elevator integration is handled by our team. Nursing, orderly, and engineering staff receive a short operational training. No clinical-system integration required.	Configured fleet and trained staff, ready for live operation.
3. Go-live & hypercare Days 26–30+	Full deployment with 30-day hypercare from EvoPulse’s Caribbean operations team. Dashboards track delivery times, cleaning coverage, and uptime.	SLA-backed uptime and on-island response within 24 hours.

9. Strategic Recommendations for Executives

Immediate — within 30 days

- Request a no-cost EvoPulse facility assessment to produce an ROI model calibrated to your bed count, nursing roster, and service volumes.
- Identify one or two high-volume logistics corridors — typically lab and pharmacy runs — where a FlashBot delivery robot can be deployed first for fast, visible impact.

Short-term — within 90 days

- Deploy CC1 cleaning — mopping, scrubbing, and vacuuming — on the overnight clinical shift to raise environmental hygiene consistently and relieve cleaning staff.
- Add MT1 for large public areas and BellaBot at the main entrance to relieve environmental-services and front-desk staff during peak periods.

Strategic — within 12 months

- Build a three-year automation roadmap spanning delivery (FlashBot, T300/T600), cleaning (CC1, MT1), and reception (BellaBot).
- Use documented infection rates, reduced overtime, and improved staff retention as evidence for accreditation and as a competitive differentiator as automation capacity begins to factor into hospital ratings.

Hospitals that automate the non-clinical layer now will lead their peers on infection rates, nurse retention, and cost per patient encounter — the metrics that increasingly define accreditation and reputation.

Next step

Request a no-cost, no-obligation facility assessment. EvoPulse will conduct a full review of your hospital or health system and return a custom ROI model and phased deployment plan built for your specific operational profile.



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