IMPACT ASSESSMENT OF CSR PROJECT OF UPGRADATION OF ACADEMIC, TRAINING ACTIVITY OF TERTIARY CARE CARDIAC SUPER-SPECIALTY TEACHING INSTITUTE FOR HEART LUNG TRANSPLANT PROGRAMME FROM CSR FUND OF GUJARAT GAS LIMITED (GGL)

Submitted to

GUJARAT GAS

Submitted by

IIPH INDIAN INSTITUTE of PUBLIC HEALTH GANDHINAGAR

ESTABLISHED BY GOVT. OF GUJARAT AND PHFI

Table of Contents

Executive Summary **1**
Overview on Global and Indian Burden of Cardiac Diseases **2**
U.N. Mehta Institute of Cardiology & Research Centre: Expansion and Capabilities **2**
Corporate Social Responsibility (CSR) and the UN Mehta Institute **3**
Objectives of the Impact Assessment **8**
Methodology **8**
Key Findings **10**
Conclusion **14**
Recommendations **15**
References **15**
Annexure **17**

Executive Summary

This report evaluates the significant impact of Corporate Social Responsibility (CSR) support from Gujarat Gas Limited and other philanthropic contributions on the U.N. Mehta Institute of Cardiology & Research Centre (UNMICRC) in Ahmedabad, Gujarat. UNMICRC has undergone a substantial transformation, expanding its bed capacity from 450 to 1251, making it the largest single super-specialty cardiac hospital in India and one of the largest globally. This expansion includes a dedicated Pediatric Heart Hospital wing, enhancing its infrastructure and medical facilities. The institute's mission is to provide affordable or free cardiac care to all segments of society through government health schemes and subsidized treatments. The GGL CSR Contribution specifically facilitated the acquisition of advanced medical equipment and consumables, including Coronary Cutting Balloons, Intravascular Ultrasound (IVUS) Catheters, Transcatheter Aortic Heart Valves (TAVR/TAVI), PTCA Guidewires, Microcatheters, Excimer Laser Atherectomy Systems, Drug-Coated Balloons (DCB), and Portable Ultrasound Machines.

The assessment, based on patient feedback, quantitative data, and staff interviews, reveals a largely positive impact. Patient satisfaction with medical services, particularly doctor and nursing care, was exceptionally high (above 90%, with some aspects reaching 98-100%). Patients recognized the positive impact of new equipment on their recovery and appreciated the subsidized or free treatment made possible by CSR. The expanded facilities led to significant increases in cardiac surgeries, Cath Lab Procedures, and Outpatient Cardiology Visits. Complex procedures like TAVI were non-existent before CSR support, and became regular. Staff highlighted improved time efficiency, clinical benefits (especially for emergencies), and operational efficiency due to portable ultrasound machines. They also emphasized that CSR Contribution of specialized consumables enabled complex angioplasty cases and TAVI procedures to be performed at zero out-of-pocket cost for economically weaker patients under schemes like Ayushman Bharat, a procedure that would otherwise cost ₹15-20 lakhs. The upgrades also enhanced training and skill development for medical staff and postgraduate students.

Despite these successes, challenges remain, with demand often exceeding the supply of high-cost technologies and a continuous need for support for consumables, particularly for heart-lung transplant medicines like immunosuppressants and antibiotics. Recommendations for future CSR efforts include sustained funding for critical medications, strategic investment in emerging high-cost technologies, ongoing staff training, performance dashboards for CSR-funded equipment, continued community outreach, and addressing operational bottlenecks related to ease of access and timeliness of services. This collaborative model between the institute and corporate philanthropy is crucial for addressing India's growing burden of heart disease.

Overview on Global and Indian Burden of Cardiac Diseases

Cardiovascular diseases (CVDs) remain the leading cause of mortality worldwide, accounting for an estimated 17.9 million deaths each year globally.(1) In 2021 alone, CVDs caused 20.5 million deaths (nearly one-third of all deaths) and affect over 500 million people globally. About 4 out of 5 CVD deaths are due to heart attacks and strokes, with a disproportionate burden (around 80%) falling on low- and middle-income countries.(2) Common risk factors such as unhealthy diets, physical inactivity, tobacco use, and air pollution contribute to the rising incidence of heart disease worldwide.(1)

India faces an especially heavy burden of heart disease. CVDs are the leading cause of death in India, responsible for roughly 26–27% of all deaths in the country.(3) By some estimates, India accounts for about 60% of the world's heart disease burden despite having less than 20% of the global population. Heart disease often strikes Indians at younger ages: 50% of all heart attacks in Indian men occur under age 50, and 25% occur under age 40 – a striking contrast to Western countries. Indian women also suffer high cardiac mortality rates. Contributing factors include a genetic predisposition (South Asians have higher risk of metabolic syndrome) and lifestyle shifts (e.g. rising diabetes, hypertension, smoking, and poor diet).(4) This "silent epidemic" of heart disease in India highlights the urgent need for preventive measures and improved cardiac care infrastructure.

U.N. Mehta Institute of Cardiology & Research Centre: Expansion and Capabilities

The U.N. Mehta Institute of Cardiology and Research Centre (UNMICRC) in Ahmedabad, Gujarat, is one of India's premier cardiac hospitals. It has recently undergone a major expansion, transforming its capacity and facilities. The institute expanded from 450 beds to 1251 beds. This expansion (completed in 2020) makes UNMICRC the largest single super speciality cardiac hospital in India, and even among the largest in the world. The growth includes a dedicated Paediatric Heart Hospital wing, which helped the institute become the country's biggest cardiology center with world-class infrastructure and medical facilities.(5) It is affiliated with the BJ Medical College and serves as a teaching hospital, training the next generation of cardiologists and cardiac surgeons.

Advanced services such as heart and lung transplantation, a dedicated advanced heart failure management program, and even a robotic cardiac surgery facility are available. The imaging infrastructure is cutting-edge, with cardiac CT scanners and a 3-Tesla cardiac MRI for detailed diagnostics. The institute has also embraced innovations like tele-cardiology (allowing remote expert consults and rural outreach) and cardiac rehabilitation units for patient recovery.(6) It even boasts "ICU on wheels" mobile cardiac ambulances equipped with ventilator, IABP, ECMO, etc., for critical transport.(5)

Crucially, UNMICRC's mission is to provide affordable or free cardiac care to all segments of society. It operates many government health schemes and subsidized treatments so that even underprivileged patients can access high-quality cardiac care. This inclusive ethos – "quality cardiac care at concessional or no cost" – combined with its massive scale, has made UN Mehta a lifeline for cardiac patients not just in Gujarat but across India.(6) The expansion to 1251 beds greatly increases its reach, and the institute now handles tens of thousands of cardiac

patients annually, ranging from newborn babies with heart defects to elders needing valve replacements

Corporate Social Responsibility (CSR) and the UN Mehta Institute

Corporate Social Responsibility initiatives have played a significant role in supporting cardiac care in India, and the UN Mehta Institute is a prime example of how philanthropic and CSR contributions can bolster public health infrastructure. The institute actively encourages partnerships with corporate CSR programs to further its research, upgrade facilities, and fund charitable care. In its future vision, UNMICRC explicitly includes "consideration of Corporate Social Responsibility by corporate houses for upgradation, research, and charitable activity at the institute."(7) This reflects a broader trend in India's healthcare sector, where corporate-funded foundations and CSR programs are stepping in to bridge gaps in public health. By leveraging CSR funds, UNMICRC has been able to upgrade into a world-class facility and simultaneously ensure inclusivity. This partnership between a public charitable trust hospital and private philanthropy is saving countless lives– from support free child heart surgeries to building new ICUs. As heart disease continues to rise in India, such collaborative efforts between government, institutes, and corporates will be crucial in scaling up the infrastructure and making high-end cardiac care available to all strata of society.

Gujarat Gas Limited (GGL) provided a CSR contribution of ₹6.30 crore in FY 2022 23 to the U. N. Mehta Institute of Cardiology & Research Centre (UNMICRC) in Ahmedabad. This support has supported a comprehensive upgradation program at UNMICRC, a leading tertiary care cardiac hospital and teaching institute. UNMICRC has recently expanded from 450 to 1251 beds, becoming the largest single-specialty cardiology hospital in India (and one of the largest in the world). To fully realize the benefits of this expansion, the CSR project focused on enhancing key facilities and capabilities of the institute. The aim was to enhance and upgrade the cardiac care facilities for upgrading cardiac care facilities of the hospital. The provision of highly technical and sophisticated medical equipments were provided with an aim to upgrade patient care, treatment facilities for heart lung transplant program. Further, these upgraded facilities will also strengthen the academic, training, and teaching activities of the tertiary care cardiac super-specialty teaching institute.

To tackle the growing cardiac disease burden, modern cardiology employs a range of advanced interventional devices and consumables. These technologies allow minimally invasive treatments for coronary artery disease, structural heart problems, and other cardiovascular conditions. Below is an overview of the support provided by GGL through its CSR to UNMICRC:

- **Coronary Cutting Balloons:** A specialized angioplasty balloon with tiny metal blades (atherotomes) on its surface that score and cut plaque during inflation. By making radial micro incisions in a hardened lesion, a cutting balloon can improve balloon expansion and reduce elastic recoil in tough or calcified blockages. These are often used for in-stent restenosis or heavily calcified coronary lesions where a regular balloon cannot dilate effectively. For example, the FDA-approved Wolverine cutting balloon (Boston Scientific) is used to modify calcified plaque and improve outcomes in resistant lesions.(8)

- **Intravascular Ultrasound (IVUS) Catheters:** IVUS involves a tiny ultrasound probe (often ~40 MHz) mounted on a catheter that is inserted into coronary arteries. It provides real-time cross sectional imaging of the artery from the inside, allowing cardiologists to assess plaque burden, vessel size, and stent deployment. IVUS guidance significantly improves the safety and efficacy of angioplasty and stenting – a large meta-analysis of over 27,000 patients found IVUS-guided stent placement reduced the risk of long-term cardiovascular death by ~33% compared to angiography guidance alone. By ensuring optimal stent expansion and apposition (and detecting complications like dissections), IVUS helps prevent stent under-expansion, which is a known cause of restenosis.(8) Modern IVUS catheters (e.g. 45 MHz coronary IVUS) offer high resolution imaging that is invaluable in complex cases (though very calcified segments may shadow the ultrasound image). Overall, IVUS has become a standard adjunct in complex PCI (percutaneous coronary intervention) to improve outcomes
- **Transcatheter Aortic Heart Valves (TAVR/TAVI):** For patients with severe aortic valve stenosis who are high-risk or unsuitable for open-heart surgery, transcatheter aortic valve replacement (TAVR) provides a lifesaving minimally-invasive alternative. Systems like Medtronic's Core Valve Evolut R (a self-expanding bioprosthetic valve) can be delivered via catheter (usually through the femoral artery) and implanted in the diseased aortic valve without open surgery. TAVR technology has advanced rapidly; trials in even low-surgical-risk patients show comparable or superior outcomes to surgical valve replacement. Notably, 5-year data from the Evolut Low Risk Trial showed that the Evolut TAVR system had a slightly lower rate of all-cause death or disabling stroke at 5 years compared to surgery, with excellent valve hemodynamics and durability. In other words, TAVR with devices like Evolut R has proven safe and effective long-term, expanding treatment options for elderly patients. The CoreValve/ Evolut series' self-expanding design and supra-annular valve position contribute to outstanding valve performance over time.(9)
- **PTCA Guidewires for Coronary Interventions:** Modern percutaneous coronary intervention relies on an array of specialized guidewires to navigate through complex arterial anatomy. PTCA wires from manufacturers like Asahi Intec are finely engineered for various purposes – from extremely soft, flexible wires that can traverse micro-channels, to stiff wires that can penetrate calcified occlusions. For example, the Asahi SUOH 0.3 is an ultra-soft wire often used to cross tortuous collateral vessels in chronic total occlusion (CTO) cases. In contrast, the Asahi Conquest Pro 12 is a very high-tip-load wire (12 gram force tip) designed to drill through very hard or occluded lesions that softer wires cannot penetrate. Other popular wires include the Asahi Sion series (Sion, Sion Blue, Sion Black) which serve as workhorse wires with excellent torque control for everyday lesions,(10) and the Gaia series (e.g. Gaia Second) which are tapered CTO wires balancing penetration and steerability.(11) The Asahi Fielder XT is a polymer-jacketed floppy wire ideal for navigating microchannels in totally occluded arteries.(10) By using a combination of these wires (often escalating from softer to harder as needed), interventional cardiologists can safely achieve success in opening chronic total occlusions and complex lesions that were once considered untreatable.
- **Microcatheters (e.g. Super Cross):** Microcatheters are small lumen catheters that can be advanced over a coronary guidewire to provide support, aid in steering, and allow

exchange of wires while deep in the artery. For instance, the Super Cross series of microcatheters (with various tip curvatures) help in selectively engaging challenging side branches or delivering guidewires through collateral channels in CTO interventions. They offer increased support and torque transmission, which is particularly useful in difficult lesions. By facilitating guidewire manipulation and device delivery, microcatheters have become indispensable in complex PCI.(12) They also enable techniques like retrograde CTO intervention (crossing from collateral vessels) by allowing the operator to traverse tiny channels safely. In summary, microcatheters act as supportive extensions of the guiding catheter, enhancing the reach and control of guidewires in complex coronary anatomy.

- **Excimer Laser Atherectomy System**: Excimer Laser Coronary Atherectomy (ELCA) is an advanced plaque-modification technique used for certain complex coronary lesions (e.g. heavily calcified, fibrotic, or in-stent restenosis with fibrous scar). The system delivers pulses of ultraviolet laser energy (308 nm excimer laser) via a catheter to ablate atherosclerotic plaque by photochemical, photothermal, and photomechanical mechanisms.(8) In simple terms, the laser vaporizes plaque components and can crack calcium, helping to open up arteries that balloons cannot dilate. The CVX-300 Excimer laser (Philips) is one such system used in cath labs. ELCA is particularly useful for lesions that are "undilatable" (balloon won't expand) or "uncrossable" (wire can cross but not larger devices). By breaking down plaque and thrombus, laser atherectomy can facilitate stent delivery and expansion. It has also been used to burn off hardened scar tissue inside stents (to treat in-stent restenosis). While not as commonly used as other atherectomy like rotational burrs, excimer laser is a valuable tool in the armamentarium, offering a unique mechanism of action. It requires specialized operator training but can be life saving in certain scenarios (e.g. laser can vaporize thrombus in acute clot-filled arteries or cut through calcium when rotational atherectomy is too risky).
- **Drug-Coated Balloons (DCB)** – e.g. IN.PACT Admiral: Drug-coated balloon angioplasty is a technique especially used in peripheral artery disease (and sometimes in coronary in-stent restenosis) to prevent renarrowing of vessels. The IN.PACT Admiral is a leading DCB for peripheral use, coated with the anti-proliferative drug paclitaxel. After the balloon mechanically opens the vessel, it delivers paclitaxel to the vessel wall, inhibiting scar tissue proliferation. Clinical trials have shown superior long-term results with DCBs compared to standard balloon angioplasty (PTA) in peripheral arteries. For example, in femoropopliteal artery disease, the IN.PACT SFA trial demonstrated the paclitaxel DCB had significantly better patency and lower re-intervention rates out to 5 years.(13) Real-world registry data at 5 years found about 69.4% of patients treated with the IN.PACT Admiral had no need for repeat intervention (target lesion revascularization) through 5 years, indicating durable efficacy.(14) This is a major improvement over plain balloon angioplasty, where disease often returns sooner. The use of DCBs (sizes like 5×150 mm, 6×150 mm, etc., as listed) is now common in treating long segments of peripheral arterial disease (e.g. superficial femoral artery), as it can restore blood f low while avoiding leaving behind a stent. This is advantageous in long lesions where stents could pose fracture risk. Thus, DCBs like IN.PACT Admiral have become standard for certain peripheral interventions, yielding high rates of limb salvage and freedom from restenosis.(14)

- **Portable Ultrasound Machines**: Portable and handheld ultrasound devices have revolutionized bedside diagnostics in cardiology and critical care. In the context of cardiac care, a portable ultrasound (including handheld echocardiography devices) enables immediate, point-of-care cardiac imaging – often termed focus cardiac ultrasound (FoCUS) or point-of-care echocardiography. Clinicians can perform a quick cardiac ultrasound at the bedside to evaluate heart function, detect pericardial effusions, guide emergency decisions (like in cardiac arrest or shock), and even assess blood vessels for IV access or clots. The convenience and speed of modern portable ultrasound improve patient assessment in ICU and emergency settings, providing real-time insights without needing to wheel the patient to the echo lab.(15) For example, in an ICU, a portable echo can instantly show if a patient has cardiac tamponade, severely reduced ejection fraction, or volume overload. These machines are lightweight and can be moved room to room, improving workflow and diagnosis speed.(16) In cardiology departments, handheld ultrasound (some no bigger than a smartphone) is increasingly used by cardiologists during clinic visits for a quick look at heart structure and function. Overall, portable ultrasound has become a critical tool for expanding access to cardiac imaging, training non cardiologists in basic echo, and expediting care by enabling rapid diagnostics at the point of care.

Table 1: Brief Summary of Key features and uses of Support provided by GGL CSR

Consumable/Equipment	Key Features of Consumable	Primary Use of Consumable	Specific Clinical Benefits/Outcomes
Excimer Laser Atherectomy System	308 nm excimer laser, ablates plaque	Plaque modification for complex lesions	Vaporizes plaque, cracks calcium, facilitates stent delivery in "undilatable" lesions, treats in-stent restenosis
Portable Ultrasound Machines	Portable, Handheld, lightweight device with multiple probes	Bedside cardiac diagnostics	Immediate point-of-care imaging, early diagnosis, quicker intervention, improved patient comfort, reduced transport
Drug-Coated Balloons (DCB)	Coated with anti-proliferative drug (e.g., paclitaxel on IN.PACT Admiral)	Preventing vessel renarrowing (e.g., peripheral arteries)	Delivers drug to vessel wall, inhibits scar tissue, superior long-term patency, lower re-intervention rates

Coronary Cutting Balloons	Tiny metal blades, radial micro-incisions	Modifying tough/calcified plaque	Improves balloon expansion, reduces elastic recoil, effective in in-stent restenosis
Transcatheter Aortic Heart Valves (TAVR/TAVI)	Minimally invasive, self-expanding bioprosthetic valve (e.g., CoreValve Evolut R)	Aortic valve replacement for high-risk patients	Life-saving alternative to open surgery, comparable/superior outcomes, faster recovery (2-3 days)
Intravascular Ultrasound (IVUS) Catheters	Miniature ultrasound probe (~40-45 MHz)	Real-time internal artery imaging	Optimizes stent deployment, reduces long-term cardiovascular death risk (~33%), prevents restenosis
Microcatheters (e.g., SuperCross)	Small lumen, various tip curvatures	Guidewire support and exchange	Aids steering, delivers guidewires, increases support/torque, enables retrograde CTO intervention
PTCA Guidewires	Various tip loads and flexibilities (e.g., Asahi SUOH, Conquest Pro, Sion, Gaia, Fielder XT)	Navigating complex arterial anatomy	Enables crossing tortuous vessels, penetrating hard occlusions, successful CTO interventions

Figure 1: Glimpse of Equipment Support provided by GGL

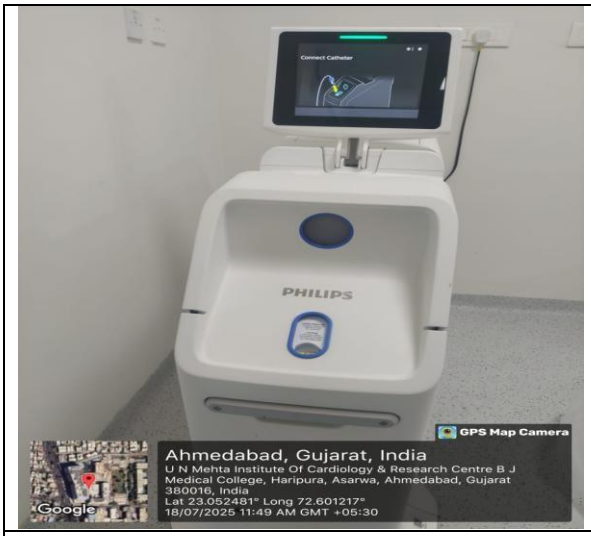

Fig. 1(a) Excimer Laser System with Accessories

Fig. 1(b) Portable Ultrasound Machine

Objectives of the Impact Assessment

- Evaluate the utilization and impact of the consumables and equipment from the CSR support of GGL in terms of patient satisfaction, and patient volume.
- Document the operational changes and staff perspectives because of CSR support from GGL

Methodology

A mixed-methods evaluation approach was used combining quantitative data analysis with qualitative insights, to comprehensively assess the project's impact. The assessment was carried out in two main parts - quantitative Analysis, comprising secondary data analysis from UNMICRC's records before and after the upgradation, and qualitative Analysis, which included in-depth qualitative feedback from those directly involved in the use of the upgraded facilities, through semi-structured interviews with medical, nursing staff, and other

stakeholders at UNMICRC. Additionally, a short patient (or family members) survey was conducted through purposive sampling.

Sample and Administration

- Target group: Beneficiaries and caregivers accessing upgraded services.
- Mode: Structured in-person or telephonic interviews.
- Languages: Gujarati, Hindi, and English.

A. Patient Survey

A semi structured tool was used to collect data from patients. The patient survey targeted beneficiaries and caregivers who accessed the upgraded services at UNMICRC. Data was collected through structured in-person or telephonic interviews, offered in Gujarati, Hindi, and English to ensure broad participation and comfort for respondents. The areas covered by the questionnaire are as follows:

- Demographics and history of previous visits
- Awareness of upgraded facilities
- Utilization of new infrastructure (e.g., ICU, cath lab, transplant services)
- Satisfaction across service dimensions (timeliness, cleanliness, communication)
- Perceived impact on treatment outcome
- Open-ended reflections on experience and suggestions

The detailed questionnaire is attached as Section I of Annexure A.

All responses were collected anonymously and digitized for analysis using MS Excel, employing a mix of closed-ended Likert scale questions for numerical aggregation and open responses for thematic exploration.

B. Secondary Data Analysis

Data Sources

Year-wise comparisons were conducted using internal hospital data obtained from monthly and annual service records (FY 2021–22 to FY 2024–25) from the hospital's Management Information System (MIS). Indicators tracked:

1. Cardiac surgeries
2. Catheterization lab procedures
3. Outpatient cardiology visits
4. TAVI procedures performed (Transcatheter Aortic Valve Implantations)
5. Procedures performed with the Excimer Laser system
6. Training sessions/workshops conducted using upgraded facilities (e.g. simulation lab)

This template for data collection is attached as Section II of Annexure A.

C. Staff Interviews

Open ended semi-structured interviews were conducted with UNMICRC staff, including Cardiologist Radiologist, Surgeon, Nurses, Administrator, and Biomedical Technician. The interview highlighted the clinical, operational, time, and cost benefits of the CSR-supported facilities, as detailed questionnaire is presented in Section III of Annexure A. The duration of

the interview was approximately 20 minutes each respondent, and was conducted in the respondent's preferred language. Responses were transcribed and analysed thematically.

Key Findings

The assessment yielded comprehensive insights into the impact of CSR Contribution:

A. Patient Satisfaction and Observed Improvements (from Patient Survey):

Patient satisfaction with the core medical services was exceptionally high for doctors' and nursing care. Furthermore, most of patients reported that new equipment positively impacted their recovery or treatment experience. The detailed analysis of the patient satisfaction is presented below:

- Overall Satisfaction, Cleanliness & Comfort, Communication by Staff, Doctors' Care Quality, Nursing & Staff Care, Recovery Experience, and Care Quality Compared to Expectations all scored above 90%, with several reaching 98–100% satisfaction.
- Benefit from New Equipment (90%) confirms that patients recognize and appreciate the impact of advanced tools like portable ultrasound, TAVI valves, and cutting balloons. All the respondents realized the improvement in quality of life The realization that these advanced tools improve the quality of life was mentioned by all the respondents. Further, the patients also appreciated the zero or nil out of pocket expenditure which was possible because of the CSR support.
- "Overall Rating after Upgrades" and "Care Quality Compared to Expectations" received high marks (100%), reaffirming the positive perception shift brought by CSR-backed interventions.
- Timeliness of Services (82%) and Ease of Accessing Care (78%), received slightly lower satisfaction scores. This indicates a minor delay and a little longer wait time, primarily due to the high patient flow and heavy caseload.

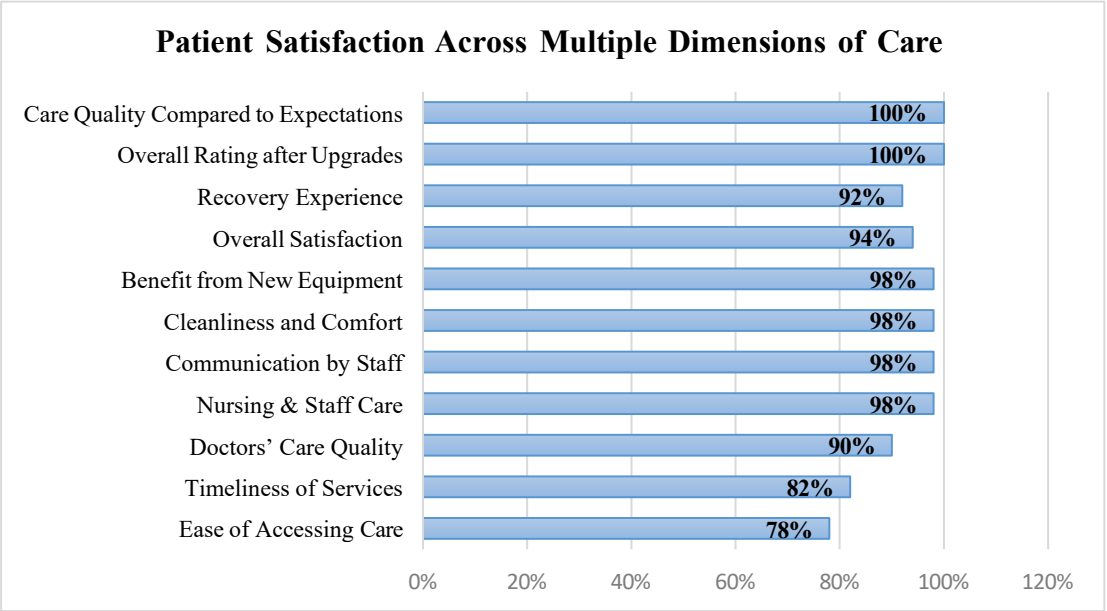

Figure 2: Patient Satisfaction level across multiple dimensions of care

The above chart demonstrates high patient satisfaction levels across clinical, operational, and experiential parameters, affirming the tangible value felt by the patients with respect to the upgraded services and equipment in enhancing care delivery at UNMICRC.

B. Utilization of Consumables/Equipment with support from GGL CSR

The utilization pattern captures six key indicators across four financial years (FY 2021–22 to 2024–25), segmented as pre-upgrade vs. post-upgrade periods. The pre-upgrade captures the data from FY 2021-22, and 2022-23, while the post-upgrade captures the data from FY 2023-24 and 2024-25.
It can be seen that the cardiac surgeries increased by 57.7%, Cath Lab Procedures grew by 37.3%, and Outpatient Cardiology Visits increased by 55.5%.
TAVI Procedures were virtually non-existent before the support from GGL, while after the support was received, the number of procedures increased to 14 in FY 2023-24 and 13 in FY 2024-25. The use of the excimer laser machine increased to 15 in FY 2024-25, indicating the integration of complex lesion treatment capacity.

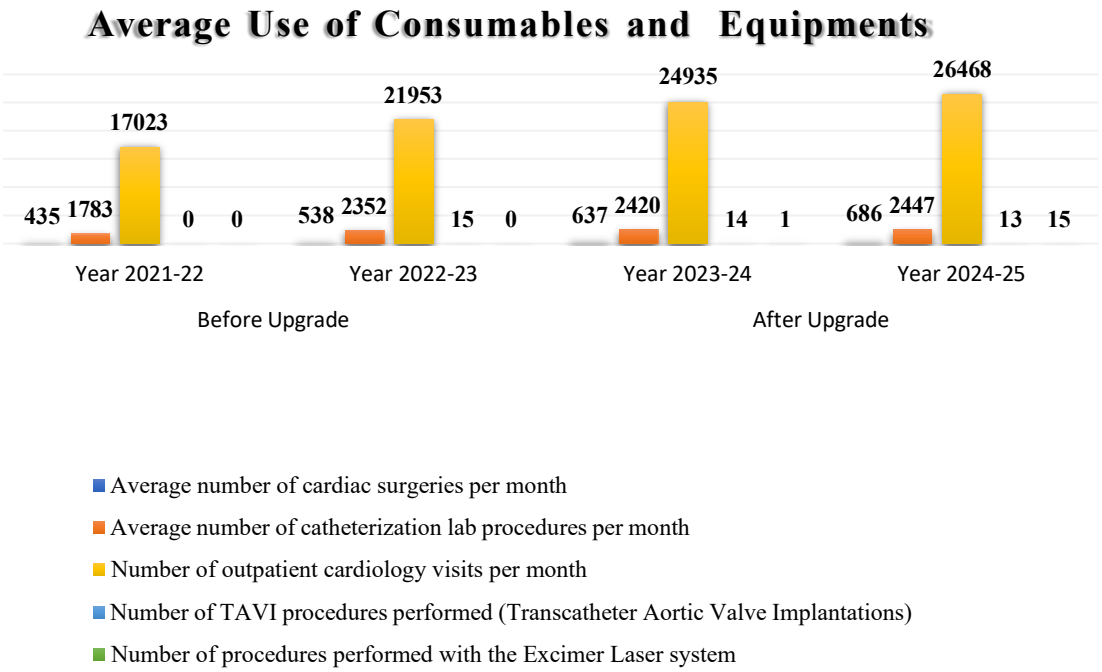

Figure 3: Annual use of Consumables and Equipment by UN Mehta Hospital

Figure 5 reinforces the quantitative findings by demonstrating that the CSR-supported infrastructure upgrades and provision of high-cost consumables (such as advanced catheters, cutting balloons, and TAVI valves) have directly enabled the hospital to perform complex, life-saving cardiac interventions at a scale and level of affordability that was previously unattainable. By bridging critical resource gaps, these contributions have not only increased the number of advanced procedures performed but have also ensured that economically disadvantaged patients receive these cutting-edge treatments free of cost or at a highly subsidized rate, thereby improving survival outcomes and quality of care.

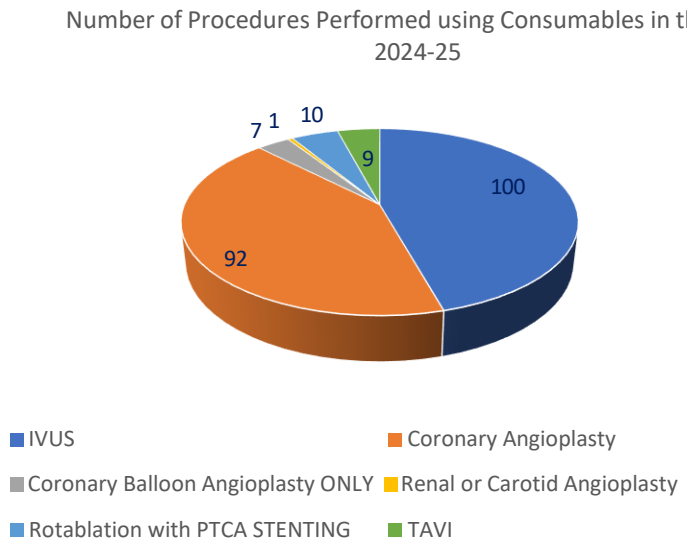

Figure 4: Procedure Performed using CSR funded Consumables

C. Staff Perspectives on Clinical, Operational, Time, and Cost Benefits (from Staff Interviews):

Staff interviews underscored the profound positive effects of the CSR-supported facilities across various dimensions:

Portable Ultrasound Machine:

- Time Efficiency: The portability of the ultrasound machine allows bedside diagnostics, avoiding patient transport, and enabling early diagnosis and quicker intervention.
- Clinical Benefits: The machine is essential for emergencies like pleural or pericardial effusions where immediate intervention (e.g., tapping, catheter placement, biopsy) can be guided on the spot.
- Operational Efficiency: Staff reported reduced downtime since the portable device can be moved between floors, ensuring that no patient has to wait for equipment availability.
- Patient Comfort: Bedside diagnostics increase patient convenience, especially for critical or ventilated patients.
- Staff Experience: "We become mentally peaceful. Patients get treatment quickly. Clinicians benefit as the work is done immediately," said one clinician.

Consumables and Complex Interventions:

- Specialized consumables such as cutting balloons, IVUS catheters, and guidewires were crucial, and the CSR support from GGL enabled complex angioplasty cases to be performed under the Ayushman Bharat scheme, which would otherwise be financially unfeasible due to their high cost.
- These advanced tools allow UNMICRC to handle complex cases without burdening patients financially, maintaining zero out-of-pocket cost for economically weaker patients.

TAVI (Transcatheter Aortic Valve Implantation):

The impact of TAVI procedures, made possible by CSR Contributions, was highlighted.

- A single TAVI procedure typically costs ₹15–20 lakhs in India, but with CSR Contributions, UNMICRC performs these procedures completely free under Ayushman Bharat, where the package is around 1 lakh plus travel support, which shows there is no Out of Pocket Expenditure (OOPE).
- TAVI drastically improves the quality of life for elderly, high-risk patients who are unfit for surgery. One senior cardiologist noted:

Training and Skill Enhancement:

- Staff received valuable on-the-job training and support from equipment specialists, ensuring seamless integration of new technologies into clinical practice, which is a continuous Process.
- As a teaching hospital, UNMICRC's postgraduate students now gain exposure to cutting-edge technologies, significantly elevating the institution's academic value and preparing the next generation of specialists.

Operational Challenges and Needs:

Despite the significant advancements, staff interviews also brought to light several ongoing operational challenges and needs:

While current contributions were sufficient, demand often exceeds supply. Staff suggested future contributions can include ongoing support for all consumables. The details of the operational challenges and needs as represented from the interview are:

- **Demand Exceeds Supply for High-Cost Technologies:** While current contributions, such as one valve for TAVI procedures, were sufficient to initiate these advanced treatments, staff noted that the demand for such high-cost technologies often exceeds the available supply. This indicates a continuous and increasing need for support for these specialized devices to meet the growing patient load.
- **Need for Future contributions of Specific High-Cost Technologies:** Staff specifically suggested that future contributions should include other high-cost technologies like the Position Emission Tomography (PET), Mitra Clip. This implies that the current range of donated equipment, while beneficial, does not cover all critical advanced interventional tools that could further enhance patient care and expand the scope of treatable conditions.
- **Ongoing Support for Consumables:** A crucial need identified was for consistent and ongoing support for consumables. These are essential for daily operations and complex procedures, and their consistent availability is vital for maintaining the quality and volume of care without interruption.
- **Support for Heart-Lung Transplant Medicines:** Staff also highlighted the need for support for heart-lung transplant medicines, specifically mentioning immunosuppressants and antibiotics. These medications are critical for the long-term success and survival of transplant patients, and their high cost can be a significant and prohibitive burden for patients and the institution alike.

Figure 5: UN Mehta Staff Interview by IIPHG Team

These challenges indicate that while CSR initiatives have greatly enhanced UNMICRC's capabilities, sustained and expanded support is necessary, particularly for high-cost technologies, essential consumables, and post-transplant medications, to ensure the institute can continue to provide comprehensive and accessible advanced cardiac care.

Conclusion

The CSR initiative, particularly through support from Gujarat Gas Limited and other philanthropic entities, has demonstrably yielded tangible improvements in UNMICRC's capacity, patient care quality, and service efficiency. This support has been instrumental in the institute's trajectory towards becoming a national-level hub for advanced cardiac care, while crucially maintaining its commitment to affordability and accessibility for all segments of society. The CSR-backed upgrades have significantly elevated UNMICRC's clinical and operational capabilities, leading to improvements in patient outcomes, overall satisfaction with clinical care, and institutional throughput.

Furthermore, the need for sophisticated consumables and life-saving technologies is emerging, which indicates that while the initial investments have been transformative, sustained and strategic long-term CSR support is essential to fully realize the institute's potential and meet the escalating demands of India's cardiac disease burden.

Recommendations

To further enhance the impact of CSR support and UNMICRC's overall performance, the following recommendations are put forth:

- **Ongoing Training Modules for Clinical Staff:** Regular refresher courses and onboarding modules for new staff are crucial to ensure the effective and safe utilization of advanced devices. Track on this continuous education will maximize the benefits derived from sophisticated equipment and maintain high standards of patient care.
- **Performance Dashboards for CSR-Funded Equipment:** Implementing a CSR-specific dashboard to track the usage, downtime, and return on investment (ROI) of each major equipment type is recommended. Such a system would provide valuable data for optimizing resource allocation, identifying maintenance needs, and demonstrating the tangible impact of philanthropic contributions.
- **Continued Community Outreach:** Raising awareness among rural referrals and partner hospitals about the upgraded services available at UNMICRC is vital. This will ensure that the expanded capacity and advanced treatments reach a broader population, particularly those in underserved areas, thereby maximizing the institute's societal impact.
- **Annual Impact Reporting:** Annual patient and staff surveys, alongside detailed impact reporting, will maintain transparency and foster stakeholder engagement. This consistent feedback loop will allow for continuous improvement, demonstrating accountability and providing a basis for future strategic planning for CSR initiatives.
- **Address Operational Bottlenecks:** While not explicitly a CSR support recommendation, the institute should prioritize internal initiatives to address patient dissatisfaction related to ease of access, appointment systems, and timeliness of services. This could involve investing in digital patient management systems, optimizing patient flow protocols, and potentially increasing administrative support staff to match the expanded clinical capacity.
- **Sustained Support for Medicines:** Future CSR efforts should consider providing ongoing support for critical medications, particularly immunosuppressants and antibiotics for heart-lung transplant patients. This consistent supply will help maintain the quality and continuity of advanced care, especially for underprivileged patients.
- **Strategic Investment in Emerging High-Cost Technologies:** As medical science advances, there will be new high-cost technologies (e.g., Mitra Clip, Position Emission Tomography, Dexa scan, etc) that can significantly improve patient outcomes. A strategic approach to identifying and support these emerging technologies through CSR will ensure UNMICRC remains at the forefront of cardiac care.

References

1. Cardiovascular diseases https://www.who.int/health-topics/cardiovascular-diseases
2. world-heart-federation.org https://world-heart-federation.org/wp-content/uploads/World-Heart-Report-2023.pdf
3. cardiovascular diseases: World Heart Day: 27% of deaths in India are caused by cardiovascular diseases - The Economic Times https://economictimes.indiatimes.com/magazines/panache/world-heart-day-27-per-cent-of-deaths-in-india-are-caused-bycardiovascular-diseases/articleshow/104031929.cms?from=mdr

4. Overview - Indian Heart Association https://indianheartassociation.org/why-indians-why-south-asians/overview/
5. Press Release:Press Information Bureau https://www.pib.gov.in/PressReleasePage.aspx?PRID=1666803
6. News Details https://www.unmicrc.org/BlogDetails?Njh8TmV3cw==
7. UnMehta - Future & Mission https://www.unmicrc.org/About/AboutFutureMission
8. Coronary calcifications, the Achilles heel in coronary interventions – PMC https://pmc.ncbi.nlm.nih.gov/articles/PMC11008515/
9. Medtronic Evolut™ TAVR system shows durable clinical outcomes and outstanding valve performance at five years in low-risk aortic stenosis patients - Mar 30, 2025 https://news.medtronic.com/2025-03-30-Medtronic-Evolut-TM-TAVR-system-shows-durable-clinical-outcomes-andoutstanding-valve-performance-at-five-years-in-low-risk-aortic-stenosis-patients
10. Cardiac Interventions Today https://citoday.com/device-guide/europe/companies/asahi-intecc-co-ltd
11. ASAHI Gaia® Series | Asahi Intecc Medical https://asahi-inteccusa-medical.com/product/asahi-gaia-series/
12. Equipment for Chronic Total Occlusions Percutaneous Coronary https://www.sciencedirect.com/science/article/pii/S0002914924006878
13. Long-Term Clinical Effectiveness of a Drug-Coated Balloon for the https://www.ahajournals.org/doi/10.1161/CIRCINTERVENTIONS.118.007702
14. 5-Year Data From IN.PACT Global Study Show Sustained Safety and Efficacy for Medtronic's In.Pact Admiral DCB - Endovascular Today https://evtoday.com/news/5-year-data-from-inpact-global-study-show-sustained-safety-and-efficacy-for-medtronics-inpactadmiral-dcb
15. Critical Care Ultrasound: Benefits, Challenges, and Best Practices https://www.gehealthcare.com/insights/article/critical-care-ultrasound-benefits%2C-challenges%2Candbestpractices?srsltid=AfmBOoppmEeruGl_rz2h4T_LXtNokwvORosqnGSYRnsrVVi8K2ijeIVg
16. Benefits Of A Portable Ultrasound Machine - Danlee Medical https://www.danleemedical.com/blog/the-benefits-of-a-portable-ultrasound-machine/

Annexure

Annexure A: Impact Assessment Survey Data Collection Tool

Section-I (Patient Feedback Questionnaire)

Question	Response
A. Patient Demographics and Background	
Name of Patient	
Age	
Gender	☐ Male ☐ Female ☐ Other / Prefer not to say
Residence Location	City/Town/Village: _____District: _____
Are you the patient or responding on behalf?	☐ Patient (self) ☐ Family member/caregiver (Relation: _____)
Have you been treated at UNMICRC before 2023?	☐ Yes ☐ No ☐ Not sure/NA
If Yes, are the current facilities improved?	☐ Significantly improved ☐ Somewhat improved ☐ No major change ☐ Can't say
B. Awareness and Use of Upgraded Facilities	
Were you aware of newly upgraded facilities/equipment (CSR project)?	☐ Yes ☐ No
If Yes, Source of Information	☐ Informed by staff ☐ Posters/Announcements ☐ Media/News ☐ Word of mouth ☐ Other: _____
Did your treatment involve new facilities/equipment?	☐ Yes ☐ No ☐ Not sure
If Yes, which ones? (Select all that apply)	☐ Upgraded ICU/Ward ☐ New OT/Surgical Equipment ☐ Transplant Program Services ☐ Advanced Imaging/Diagnostics ☐ Improved Patient Amenities ☐ Other: _____
Is this your first visit to UNMICRC?	☐ Yes ☐ No

Question	Response
C. Patient Experience and Satisfaction	
Reason for Visit	
Ease of Accessing Care	☐ Very easy ☐ Easy ☐ Neutral ☐ Difficult ☐ Very difficult
Timeliness of Services	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
Doctors' Care Quality	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
Nursing & Support Staff Care	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
Communication by Staff	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
Cleanliness and Comfort	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
Benefit from New Equipment	☐ Very much ☐ Somewhat ☐ Not much ☐ Not at all ☐ Not sure
Overall Satisfaction	☐ Very satisfied

Question	Response
	☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied
D. Comparison with Past Experience (If Repeat Patient)	
Compared to earlier visits, how was this experience?	☐ Much improved ☐ Somewhat improved ☐ No change ☐ Worse
E. Outcome and Impact of Treatment	
Post-treatment Health Status	☐ Much improved ☐ Somewhat improved ☐ No change ☐ Worsened
Is there any Impact of Upgraded Facilities on Outcome	☐ Yes, definitely ☐ Yes, maybe ☐ No, not really ☐ Not sure
Recovery Experience (if procedure done)	☐ Faster than expected ☐ As expected ☐ Slower than expected ☐ Not applicable
Did you (or your family member) receive treatment or undergo a procedure that involved any of the new equipment or upgraded facilities during your visit? (e.g., treatment in the new ICU, cath lab, new devices)	☐ Yes ☐ No ☐ Not Sure
Please specify which service or equipment was used	
How would you rate your overall satisfaction with the care and services you received at our hospital, considering the recent upgrades?	☐ 1 – Very dissatisfied ☐ 2 – Dissatisfied ☐ 3 – Neutral ☐ 4 – Satisfied ☐ 5 – Very satisfied
In your opinion, how was the quality of care after the facility upgrade compared to your expectations (or compared to past experiences elsewhere)?	☐ Exceeded expectations ☐ Met expectations ☐ Below expectations ☐ Not sure / First visit

Question	Response
Did these upgraded services available at UNMICRC benefit you in any specific way? (e.g., faster service, proximity, access to specialized procedures, etc.)	
How likely are you to recommend UNMICRC and its cardiac care services to others in need of heart treatment?	☐ 1 – Not at all likely ☐ 2 – Unlikely ☐ 3 – Neutral ☐ 4 – Likely ☐ 5 – Very likely
Do you have any suggestions for how we could further improve our services or any additional comments you'd like to share?	
F. Open-Ended Feedback	
What did you appreciate most about the care/facilities?	
Suggestions for Improvement	
Noticed Changes (compared to past visits, if applicable)	
Additional Comments	

Section II (Secondary Data)

Indicator	Before Upgrade		After Upgrade	
	Year 2021-22	Year 2022-23	Year 2023-24	Year 2024-25
Average number of cardiac surgeries per month				
Average number of catheterization lab procedures per month				
Number of outpatient cardiology visits per month				
Number of patient referrals received per month *(patients referred from other centers to UNMICRC)*				
Number of TAVI procedures performed *(Transcatheter Aortic Valve Implantations)*				
Number of procedures performed with the Excimer Laser system				
Number of training sessions/workshops conducted using upgraded facilities (e.g. simulation lab)				

(Section III- Staff Interview Guide)

Interview Question	Probes
Role: • Surgeon • Nurse • Administrator • Others	
In your experience, what have been the most significant changes in the hospital's services or operations since the new facilities and equipment were introduced through CSR support of Gujarat Gas?	-For clinicians: changes in patient care capabilities, volume or types of cases now handled (e.g. more complex surgeries) -For administrators: improvements in patient flow, capacity, or reputation of the hospital.
How does the upgraded facilities and equipment impacted your day-to-day work or workflow in your department?	-Have your daily workflows changed due to upgrades? -Any increases in efficiency or productivity? -Any reduction in workload or stress due to better equipment (e.g., faster procedures, less downtime)? -For nurses: changes in patient monitoring or care process; -For doctors: ease of performing procedures, reduced referral of patients elsewhere. - Any changes in surgical techniques, patient handling, or care delivery?

Interview Question	Probes
	- Have any processes become faster or more efficient (e.g., reduced wait times)?
Are there any new services or procedures you can offer now that were not possible before the upgrade? If so, which ones and how these affect patient care and outcome?	-Mention examples (if relevant to role): e.g. TAVI procedures, use of the excimer laser for specialized treatments, or any heart-lung transplant readiness improvements. -How have these new services benefitted patients (e.g., treating cases locally that previously required referral outside)? -Consider recovery times, success rates of surgeries, complication rates, etc. -Have these metrics improved? -Can they share any specific success story post-upgrade?
What has been the feedback from patients or their families regarding the new facilities or equipment, if anything?	-Any comments about improved care, shorter wait times, better hospital environment, etc.?
Have the upgraded facilities contributed to training or academic activities in the hospital? If so, in what ways?	-If they have been involved in any simulation trainings, workshops, or teaching sessions using the new equipment. -For faculty doctors: Has the new tech improved how you train residents/fellows? -For admin/education coordinators: Has there been an increase in training sessions or participant numbers?
Have there been any challenges or difficulties in integrating the new facilities into regular operations?	- Any technical issues, breakdowns, or equipment downtime? - Were there staff shortages or scheduling issues post-upgrade? - How has hospital management handled these challenges?
Overall, how satisfied are you with the upgraded facilities and equipment now that they are in use? Have they met your expectations?	- What are the major improvements you've noticed? - Are there aspects you are particularly satisfied or dissatisfied with? - How do these facilities compare to what was available before?
In your opinion, what has been the biggest benefit of this upgradation for the hospital and its patients?	- Have you seen changes in patient outcomes, recovery, or satisfaction? - Can you share a specific example where upgraded facilities helped a patient? - Any measurable improvements in success rates or turnaround time?
What further improvements or support would you suggest to maximize the benefits of these upgrades?	- What support/resources are needed to improve further?

Interview Question	Probes
	- Suggestions on staffing, training, or coordination? - Any ideas to maximize patient benefit or streamline processes?
Any Other Comments	- Additional thoughts, insights, stories, or feedback? - Any aspects not covered that you wish to highlight?