



Comparative Study of Emergency Air Ambulance Services: Philippines and India

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Abstract

Emergency air medical services, which use helicopters and small airplanes as flying intensive care units, are important for reaching patients in remote or disaster-affected areas. India and the Philippines both face difficult geography. India has mountains and far-flung islands, while the Philippines is made up of more than seven thousand islands. This paper compares the air emergency medical services of both countries and highlights lessons that India can learn from the Philippine experience. India has about forty-nine air ambulances across the country, supported by policies that recognize the importance of air medical services. The Philippines has far fewer resources, with only a couple of Department of Health airplanes and one military helicopter. However, the Philippines has created innovative systems. In Palawan, the Department of Health works with a non-governmental organization through a memorandum of agreement to use donated airplanes for patient evacuation. This reduces transfer times from several days to just a few hours. The Philippine government is also working to pass a law that will create a national emergency air medical services system. This paper uses a Most Similar Systems Design framework. Both India and the Philippines are lower-middle-income countries in Asia. They both have decentralized forms of government, face frequent natural disasters, and have limited financial resources. Yet their air emergency medical systems have developed in different ways, which makes them suitable for comparison. Data for this study come from government policy documents, legislative texts, news reports, and academic studies published over the past ten years. The findings show that India can learn from the Philippines by building stronger partnerships with non-governmental organizations and the military, adopting clear regulations that include air ambulances, and using new technology such as drones linked with telemedicine. India should also consider a dedicated law for air medical services, improved financing through health programs, better rural coverage, and integration with emergency dispatch systems.

Keywords: *Emergency Air Medical Services; Air Ambulances; India; Philippines; Most Similar Systems Design; Health Policy; Disaster Response; Telemedicine; Public-Private Partnerships*

Introduction

Access to timely emergency care is not just a medical necessity but also a fundamental aspect of the right to health and human dignity [1]. Air-based Emergency Medical Services (EMS) offer unique potential to bridge gaps in healthcare delivery for geographically isolated populations. In India and the Philippines—two lower middle-income countries with diverse geographies and disaster-prone regions—air ambulances often represent the only viable means to deliver care within the critical “golden hour.” This makes them essential to broader discussions on health equity, state responsibility, and disaster preparedness.

A comparative international case study approach is particularly relevant for Indian EMS policy reform. By studying the Philippines—a fellow developing country with similar fiscal constraints but different institutional pathways—India can draw practical lessons that may be more contextually applicable than those drawn from high-income countries like the United States or the United Kingdom. Comparative policy analysis highlights how countries facing parallel challenges innovate differently; in this case, the Philippines’ reliance on NGO and military partnerships offers a contrasting model to India’s more state-driven, insurance-supported system. Such international comparisons help identify feasible reforms for India while acknowledging contextual differences.

This study is situated within the Health Policy and Systems Research (HPSR) framework, which emphasizes not only the design of health interventions but also the social, political, and systemic contexts in which they are implemented. HPSR allows us to analyze air ambulance services as part of the broader health system—examining financing, governance, regulation, workforce, and integration with existing services. By applying this lens, we can move beyond technical performance metrics and consider structural reforms necessary to sustain EMS in India.

One key limitation of the comparative approach arises from differences in population density. India has a population exceeding 1.4 billion with an average density of ~470 people per square kilometer [2], while the Philippines has ~118 million people and a density of ~390 people per square kilometer [3]. Although broadly similar in their rural-urban divides—India being ~37% urban and the Philippines ~49% urban [4]—and both containing extensive remote regions, the scale and absolute population burden are not directly comparable. This limits the extent to which Philippine models can be transferred wholesale to India. Nevertheless, the comparative analysis remains valuable for extracting adaptable lessons rather than seeking one-to-one equivalence.

By situating air-EMS within a comparative and systems-oriented framework, this paper aims to provide practical insights for strengthening India’s emergency medical response—both for routine health equity and disaster resilience.

Methods and Materials

The paper employs a comparative case study approach based on a review of secondary sources, including government policy documents, media reports, legislative texts, and scholarly analyses published in the last decade. Key dimensions analyzed include fleet size, funding mechanisms, regulatory frameworks, response times, and integration with healthcare systems. While the Philippines serves as the primary comparator, sub-national Indian cases (e.g., Uttarakhand’s *Project Sanjeevani* and Madhya Pradesh’s PPP EMS model) are also examined to highlight diversity within India. The study is grounded in the Health Policy and Systems Research (HPSR) framework. The approach emphasizes understanding how air-based Emergency Medical Services (EMS) interact with wider health systems and governance structures, rather than focusing only on technical or operational aspects.

The material for this study was drawn from multiple secondary sources:

- Government policy and regulatory documents: India's *National Civil Aviation Policy (2016)*, UDAN scheme manuals, DGCA circulars, Department of Health (Philippines) Administrative Orders, and Philippine Senate Bill No. 1973 (*Emergency Medical Services System Act*).
- Official press releases and institutional reports: e.g., Press Information Bureau (India), Department of Health–MIMAROPA (Philippines), and Armed Forces of the Philippines announcements.
- Peer-reviewed journal articles, WHO reports, and NGO assessments on emergency medicine and health systems in low- and middle-income contexts.
- Credible news media accounts documenting implementation and case studies (such as the Palawan air ambulance service and Uttarakhand's HEMS program).

Limitations: This study relies solely on secondary data sources, which may vary in quality, accuracy, and depth. Since no primary or interviews were conducted, the findings depend on the validity of published information. Nevertheless, triangulation across multiple sources was used to improve reliability and to ensure that policy recommendations are grounded in a broad evidence base.

Comparative Analysis

Fleet Size and Composition

Philippines: The Philippines has no formal national air-EMS fleet. To date, dedicated assets include only a few regional aircraft. For example, in 2017 DOH-MIMAROPA began operating two light medevac planes (a six-seat Cessna 206 and a four-seat Robinson R44 helicopter) on standby for Palawan [5]. In 2022, the Philippine Army added a Bo-105 helicopter configured as an air ambulance, staffed by military medics [6]. Outside government, a handful of private EMS companies (e.g. AirGurus, Horizon) offer paid services, but overall the number of Philippine air ambulances is very small and concentrated in Metro Manila. This contrasts sharply with India: as of 2022, India had about 49 registered air ambulances nationwide [7]. Nineteen operators (state and private) run helicopters and planes; Delhi alone has 39 air-EMS aircraft [7]. Indian fleets include government-leased choppers (like Pawan Hans helicopters), hospital-owned HEMS, and chartered planes. For example, states like Uttarakhand are procuring dedicated HEMS helicopters under “Project Sanjeevani” [8].

Lesson for India: While India already has a relatively large fleet, the Philippine example shows that even small, regional fleets can have high impact. India can ensure its air ambulances are strategically placed near remote areas (islands, mountains) so that even a few aircraft can provide coverage. Conversely, India could also study PH's choice of cost-effective light aircraft; for very remote sites, small Cessna planes or R44 helos (as used in PH) may be more affordable for routine evac missions.

Funding Mechanisms

In India, many HEMS programs are funded or subsidized by government budgets. For instance, Uttarakhand's free helicopter ambulance service (launched Oct 2024) is covered by the state health fund (₹12,850 Cr outlay) [9]. Madhya Pradesh's “PM Shri Air Ambulance Seva” (2024) similarly offers free flights to Ayushman Bharat (national health insurance) beneficiaries via a public–private contract [10]. Patients incur no charge in these schemes. Outside these programs, private operators in India charge ₹3–9 lakh (US\$4,000–12,000) per mission, which patients often pay out-of-pocket or via insurance [11]. Insurance coverage for HEMS is limited and usually requires medical certification. By contrast, Philippine air ambulance funding has so far relied on mixed models: DOH pilots contribute aircraft, and

partners (like NGOs) provide crews or funding. For example, Palawan's air unit was launched through a MOA between DOH-MIMAROPA and the NGO Philippine Adventist Medical Aviation Services (PAMAS). The initial DOH aircraft was donated by a U.S. non-profit, and DOH funding supports operations. All DOH evacuations in Palawan have been free to patients. In general, Philippine emergency airlift has no dedicated national subsidy or insurance scheme; instead it depends on ad hoc DOH regional budgets and partner contributions.

Lesson for India: The Philippine approach suggests India could further leverage non-government resources. India could encourage NGOs, charities, or foreign donors to provide aircraft or support staffing (as in PH). Public-private contracts – even those involving non-profits – can relieve direct fiscal burden. For example, India might contract NGOs for HEMS in disaster-prone states under DMF (Disaster Mitigation Funds). Ensuring insurance (Ayushman or private health plans) covers airlift could mirror PH's UHC mandate of equity.

Response Times and Coverage

The effectiveness of air-EMS is measured by how much it reduces response time. In the Philippines, Palawan's new air ambulances have dramatically cut transport times. A media report noted a critical child was flown from Coron to Manila in two hours after the DOH service started– a trip that previously took several days by boat [5]. However, coverage remains limited: Palawan's two aircraft cannot instantly reach all islands, and transfers to major hospitals (in Manila) can still face delays due to congested airspace and the need for hospital helipads. (Indeed, Marikina City officials offered their rooftop helipads to expedite Palawan evacuations.) In general, many Philippine regions (Visayas, Mindanao mountains) remain beyond quick reach of the tiny fleet, leaving patients reliant on slow boats or distant ground ambulances.

India, by comparison, has emphasized golden-hour response. Uttarakhand's Project Sanjeevani aims to station helicopters at AIIMS Rishikesh covering a 150 km radius of hilly terrain, specifically to airlift accident victims into hospital within an hour [8]. That program includes a toll-free emergency line linking district control centers to the HEMS team. Likewise, India's COVID response "Lifeline UDAN" cargo flights have rapidly delivered medical supplies to remote airports nationwide. Many Indian states integrate HEMS with the 108/102 ambulance networks and insurances to reduce delays.

Outcome effectiveness metrics are increasingly used to assess these programs. International studies suggest that helicopter EMS can reduce trauma mortality by up to 15–20% when patients receive definitive care within the golden hour (Galvagno et al., 2013). Similarly, metrics such as "time-to-treatment," "survival-to-discharge," and "cost per life saved" are applied to evaluate air-EMS effectiveness. While Philippine data are limited, early Palawan reports highlight a sharp decline in preventable deaths linked to delayed evacuation. India's Uttarakhand program has also framed success in terms of the proportion of trauma patients reaching tertiary care within 60 minutes. Incorporating such metrics would allow Indian policymakers not only to document time savings but also to quantify health outcomes, ensuring that EMS investments are judged by patient survival and system efficiency rather than aircraft numbers alone.

Lesson for India: The Philippine Palawan case illustrates the potential time savings: even a small air-EMS, when placed strategically, can convert multi-day journeys into hours. India can apply this in its own remote regions (e.g., Andaman & Nicobar, Lakshadweep, Himalayan districts), ensuring those areas also get fast HEMS. The challenges PH faces – like limited helipads and congested city airspace – suggest India should invest in hospital helipads and clear-flight corridors. Finally, while PH lacks a unified EMS dispatch, India can learn to unify air ambulance calls into its 112 emergency system, as Uttarakhand plans, so every request triggers integrated ground+air response. Embedding outcome metrics such as

survival rates and time-to-treatment benchmarks into program evaluations will further strengthen accountability and ensure resources are directed where they save the most lives.

Regulatory and Legal Frameworks

India's 2016 National Civil Aviation Policy (NCAP) explicitly mandates that the Ministry of Civil Aviation "facilitate Helicopter Emergency Medical Services" by easing regulations (e.g. allowing helicopters to fly point-to-point below 5,000 ft without ATC clearance) [12]. The DGCA is tasked with drafting specific HEMS rules (crew training, flight rules). In practice, an Indian air ambulance operator must hold a DGCA Air Operator Certificate and a special HEMS permit. Under NCAP, the Regional Connectivity Scheme (UDAN) even incentivizes new air routes for medical purposes [13]. By contrast, the Philippines has no dedicated EMS law. The CAAP treats an air ambulance like any other charter aircraft: operators obtain a CAAP AOC (charter category) and must comply with general air navigation rules. CAAP has published guidance (an Air Transport Advisory Circular) requiring EMS operators to submit detailed medevac plans, but it does not grant traffic priority or special exemptions for HEMS aircraft [14]. Notably, Philippine law does recognize air ambulances in healthcare planning: DOH Administrative Order 2020 defines an "ambulance" as a vehicle by "land, water, or air" for patient transfer, implying eligibility for public funding. There is also a pending legislative push: the Philippine Senate's proposed "Emergency Medical Services System Act" (SB 1973) would create a national EMS council and formalize 911 as the nationwide emergency number.

Lesson for India: India can adopt similar clarifications and statutory backing. For example, health policies in India could explicitly classify air ambulances as covered ambulances (as PH's DOH AO does). Given PH's move to legislate an EMS Act, India might also consider a national EMS law or policy (even if not yet drafted) to unify standards for air and ground EMS. Regulatory ease in PH was limited, so India should continue streamlining: for instance, issuing CAAP-like HEMS guidelines (as NCAP directs) and ensuring quick approvals. Aligning aviation rules (DGCA) with health laws could create clear pathways for operators and funders.

Integration with Healthcare Systems

In the Philippines, air ambulances operate mostly through ad-hoc linkages. Patients from Palawan are flown directly to the national referral hospital (Philippine General Hospital in Manila) [5]. There is no unified national dispatch – calls go through local hospitals or the DOH regional office. Some local governments assist: e.g., Marikina City (Metro Manila) provides helipads and rescue support (Rescue 161) for Palawan missions [5]. Overall, Philippine EMS lacks standardized triage or transfer protocols; each region improvises. The (unified) 911 emergency hotline exists in the Philippines, but it is general-purpose and not integrated with EMS; a proposed EMS law would create a national EMS Council to set protocols [15].

India, meanwhile, is actively integrating air ambulances into its health system. States like Uttarakhand are linking new HEMS services with the existing 108/102 ambulance networks and disaster control centers via a toll-free number [9]. Air ambulances in India often coordinate with major hospitals (e.g., AIIMS) and insurance schemes (Ayushman Bharat) for referrals. During COVID-19, government fixed-wing flights were used to transport critical medicines and vaccines to hospitals under "Lifeline UDAN" [16].

The WHO's Health Emergency and Disaster Risk Management (Health-EDRM) Framework emphasizes that emergency and disaster health services should not function as isolated units, but be integrated into the broader health system. The framework highlights governance, workforce, financing, essential service continuity, and coordination across sectors as essential pillars for resilient EMS.

Against this benchmark, the Philippines remains at an early stage: while it has begun experimenting with NGO partnerships and regional air-EMS pilots, the lack of national protocols, legislation, and unified dispatch systems means EMS is only partially embedded into its health system. India is comparatively further along: integration with national insurance schemes (Ayushman Bharat), disaster response systems (NDMA/112), and hospital networks demonstrates stronger alignment with Health-EDRM principles. However, India still lacks a comprehensive national EMS law, and integration varies widely across states, leaving rural and remote areas under-served.

Lesson for India: India should continue this integration by embedding HEMS into its emergency response framework. For instance, any air ambulance should be dispatched through the national 112/108 system, enabling centralized coordination of air and ground assets. Training dispatchers in aero-medical triage (a best practice in advanced EMS) will help. Also, India can formalize inter-agency cooperation: just as PH DOH worked with local LGUs for helipads, India can have health, civil aviation (DGCA), and city authorities jointly designate hospital landing zones and rapid referral procedures. Ensuring airlifts are covered benefits under national health insurance (PMJAY) would solidify integration into routine healthcare financing.

Training and Aeromedical Staffing

The Philippines currently has no specialized aeromedical training programs. Air ambulance crews are drawn from existing personnel. For example, the new Army medevac helicopter is crewed by a “mixed team” of military doctors, nurses, and pilots [17]. Similarly, DOH air ambulance flights have DOH nurses and doctor(s) on board with basic in-flight care skills. CAAP requires pilots to hold appropriate licenses, but does not mandate HEMS-specific training for crew. By contrast, India is developing HEMS expertise. The DGCA has indicated plans to license HEMS pilots, and many Indian operators now staff flights with doctors trained in aeromedical transport (often via overseas fellowships) and paramedics certified in in-flight life support. Indian hospital-based services (e.g. Apollo, Medanta) use flight physicians and nurses akin to an ICU team. The Uttarakhand program and others aim to include trained flight paramedics.

Lesson for India: Though this section is India-focused, we can still learn from PH. The Philippine emphasis on mixed (military) teams suggests that India could also formalize joint training programs with its armed forces medevac units. India should ensure its HEMS crew (pilots, doctors, paramedics) receive structured training in aeromedical care. It could collaborate with international aeromedical centers (as some Indians do) or with Philippine counterparts once PH establishes formal EMS training.

Public-Private Partnerships

Philippine EMS aviation has leaned heavily on PPPs, often with NGOs. Palawan’s air ambulance was launched via a MOA between DOH-MIMAROPA and Philippine Adventist Medical Aviation Services (PAMAS): DOH supplied the aircraft and oversight, while PAMAS provided pilots, maintenance, and coordination [18]. Some private charities (e.g. “Air Rescuers” NGO) even offer free helicopter rescues under local government contracts. However, this remains patchwork. India too is pursuing PPP models. Madhya Pradesh’s Air Ambulance Seva is essentially a state-funded service run by a private operator (ICATT) on standby helicopters [18]. Uttarakhand’s tender for HEMS also envisages private vendors. Even India’s UDAN RCS subsidizes private carriers (cargo and passenger) that could be used for medevac. Major Indian hospital chains run their own air-ambulance, recouping costs via fees or insurance.

Lesson for India: The Philippine experience shows the utility of collaborating with non-profits and the military, not just for funding but for expertise. India should expand its partnerships: besides

private companies, it might contract with respected NGOs (as PH did with PAMAS) to operate HEMS, or officially integrate military rescue units into civilian medevac. Structured PPP contracts (like India's with ICATT) and MOAs (like PH's with PAMAS) can offload operations to specialists while maintaining public oversight.

Roles of Central and Local Governments

In the Philippines, national and local agencies share EMS responsibilities but coordination is uneven. The national DOH sets health policy and can allocate funds (as under UHC Act mandates), while CAAP/DOTr regulate the airspace. The Palawan program was initiated by the DOH regional office, but it relied on local LGUs for infrastructure: for instance, Marikina City (in Metro Manila) agreed to provide helipad zones for Palawan flights [5]. Local health offices and city governments can help by hosting EMS bases or defraying costs. In India, the central government (MoCA, MoHFW, NDRF) frames policy and provides funding (e.g. via UDAN subsidies or national health insurance), whereas state governments implement HEMS schemes. For example, Uttarakhand's Sanjeevani is funded by the state budget and integrated into its health services, while MoCA issues guidelines and nominates new airports (UDAN) with state input [9]. Coordination between layers is crucial: the DGCA must certify aircraft nationally, while state health departments station helicopters and hire crews.

Lesson for India: The PH model suggests empowering regional authorities: like PH's DOH-MIMAROPA launching Palawan EMS, India could encourage each state's health department to develop HEMS plans tailored to local needs (informed by a central EMS policy). Central agencies (MoHFW, MoCA, NDMA) can incentivize this via funding and regulation. Importantly, local governments (cities, provinces) should be partners in siting helipads, managing landing fees, and organizing ground response (mirroring Marikina's support). A successful PIL argument in India could assert that national health and aviation bodies have a duty to coordinate with state and local governments under the UHC framework and disaster laws, to fulfill citizens' right to emergency care.

Technological Integration (GPS, Telemedicine, Drones)

Both countries are beginning to harness technology for EMS. India has actively used air-based tech: during COVID, Operation *Lifeline UDAN* flew 108 medical cargo flights in one day (hauling 108 tons) to deliver essential supplies across remote states. Satellite GPS and mobile apps allow Indian HEMS crews to coordinate routes and communicate with hospitals. India is also trialing telemedicine and drone deliveries: Uttarakhand's HEMS plans include drone delivery of medicines to remote villages in minutes (e.g. 30-minute blood/supply runs) [9]. The Philippines, though slower on drones, recently pioneered a drone-based medicine delivery system integrated with telehealth: in Jan 2025 PH launched drone flights (in Rizal province) that bring medicines to remote barangays after teleconsultation. India can learn from this: it should incorporate live patient monitoring in HEMS (real-time ECG to hospital doctors) and deploy drones for blood/blood products, drawing on PH's success with the mWell telemedicine platform. Both countries can also expand GPS tracking and emergency beacon tech for search-and-rescue support.

Rural Access and Disaster Response

The Philippines experiences frequent typhoons, earthquakes and floods, often isolating island communities. Currently, national disaster response relies on military and coast guard assets (e.g. NDRRMC mobilizes AFP choppers), but there is no formal air-EMS network. Case studies (like Typhoon Haiyan) showed international choppers flew injured to Manila when local capacity was insufficient. A recent WHO report notes that Philippine emergency teams are growing but not yet fully organized for air rescue. Indian terrain similarly demands air reach: the Himalayas, jungles and islands are hard to access by road. India already uses military medevac (e.g. Air Force AHT) in disasters, but civilian HEMS can

augment this. The UDAN “Lifeline” project focused on northeast, island, and mountain regions, mirroring the PH need for archipelagic aid [6].

Lesson for India: Building a national HEMS network inherently improves disaster resilience. The PH example of making even a few medevac flights accessible in emergencies suggests India should prioritize its remote states. For instance, states like Arunachal or the Andamans are analogous to Philippine island provinces; establishing base HEMS units there (as PH did in Palawan) could save lives in multi-hazard crises. India’s PIL could thus argue that expanding HEMS is mandated by India’s duty under disaster management and health equity principles, just as PH law aims to prioritize underserved (GIDA) areas in health resource allocation.

India’s UDAN Scheme and Its Role in EMS

India’s UDAN scheme is designed to boost connectivity of small airports and even seaplane routes, not just for passengers but to “enable fast medical services in remote areas” [13]. In practice, UDAN has opened dozens of rural airstrips and heliports, which HEMS flights can utilize as bases or landing sites. During COVID-19, the government’s “Lifeline UDAN” flights transported vaccines and PPE nationwide, demonstrating the system’s medical logistics value [16]. Although UDAN does not exclusively fund EMS, its infrastructure expansion benefits any emergency service network. By contrast, the Philippines has no UDAN-equivalent. The lesson for India (and PH): planning regional air routes with health needs in mind pays off. India should continue leveraging UDAN to support medevac routes—e.g. subsidize flights linking remote districts with major hospitals at short notice. The Philippine government, analogously, might consider a dedicated program to link underserved islands to air ambulance hubs (akin to PH’s “SMART Islands” drone pilot).

Recommendations

- **National Coordination:** The Philippines highlights the value of an overarching policy mandate. A Philippine EMS Act is being debated to create a national EMS council. India could similarly codify EMS standards or form a high-level committee (perhaps under MoHFW) to coordinate EMS across states. This would formalize roles and ensure equitable access as envisioned by India’s UHC goals.
- **Dedicated Fleet:** Philippine HEMS cases show that a small, dedicated fleet (even 1–3 helis/planes per region) can save lives. India should maintain standing regional air-EMS units, not only ad-hoc charters. State investments (like Uttarakhand’s) prove political feasibility of free HEMS.
- PH’s success with NGOs (PAMAS) and military in running HEMS suggests India expand such partnerships. Contracts with experienced operators (both for-profit and non-profit) under government oversight can rapidly scale service. States or districts could mirror PH’s MOAs when launching local HEMS pilots.
- **Regulatory Clarity:** PH’s DOH ambulance order explicitly includes air vehicles. India’s health and aviation regulators should likewise clarify that HEMS counts as emergency infrastructure deserving priority (e.g. CAAP circulars and MoHFW notifications). This could include allowing low-altitude direct flights and fast-tracking permits, as NCAP has done.
- **Technology and Training:** India should adopt PH’s tech pilots: telemedicine-linked drone deliveries are proven useful and can be scaled for blood/vaccines. India also needs formal aeromedical training programs, learning from the ad hoc PH model, to ensure all HEMS crews are highly skilled.

- **Rural Focus:** As India targeted UDAN airports for medical cargo, the Philippines targeted island provinces (Palawan, Bicol, etc) for HEMS. India should similarly prioritize its “last mile” regions (e.g. tribal areas, remote islands, Himalayan valleys) when deploying HEMS.
- **Financing Models:** PH’s blend of government subsidy and NGO/donor support points to multiple funding streams. India can use its national health programs (Ayushman claims), state budgets and incentives to finance air-EMS. Encouraging insurance coverage for helicopter transfers (as the UHC Act hints at emergency benefits) will expand reach. Grants from international agencies (as PH did with US donors) are another opportunity.

Implementing these lessons would help India justify and design a robust national air-EMS system fitted to its context.

Case Studies

Palawan Air Ambulance (PH)

Palawan province (population ~1.1 million) pioneered Philippine air ambulance. In 2017, DOH-MIMAROPA began 24/7 medevac using two aircraft: a 4-seat Robinson R44 helicopter and a 6-seat Cessna 206 prop plane) [5]. Flights operate on call from Puerto Princesa airport. The program was set up via an MOA between DOH and the NGO Philippine Adventist Medical Aviation Services (PAMAS): DOH provided the aircraft and oversight; PAMAS supplied pilots, flight nurses and maintenance [18]. From Feb–Jul 2017 the service flew an average of 2–3 missions per day, transporting 99 patients [18]. One example: a 5-year-old boy was airlifted from Coron island to Manila PGH in ~2 hours (before, the trip took 2–3 days by boat) [5]. While this saved lives, challenges remain. Palawan patients often need to land at city hospitals; DOH had to coordinate with Marikina city to secure hospital helipads. The Palawan case shows that a small, well-managed regional air-EMS can dramatically improve outcomes in an island province. However, it also highlights PH’s limited scale: only Palawan’s residents benefit, and vast parts of the Philippines still lack any air evac. This underscores the need for national support to replicate such models elsewhere.

Uttarakhand’s Project Sanjeevani (IND)

Uttarakhand state (pop. ~11 million) launched India’s first government-funded HEMS in Oct 2024, called “Project Sanjeevani”. Prime Minister Modi inaugurated this free helicopter service based at AIIMS Rishikesh [9]. State-run helicopters will operate 24/7, airlifting patients from remote hill districts to AIIMS. This initiative is backed by a large health budget (₹12,850 crore over 5 years) and includes novel features: a dedicated toll-free emergency number linking all 13 district control rooms to the helicopter dispatch, and even drone deliveries – e.g., in trials, drones carried medicines from AIIMS to a remote village in Tehri in just 30 minutes [9]. Uttarakhand’s government explicitly states the goal: ensure that accident victims in the mountains reach expert care within the “golden hour” [8]. Underlying policy support came from the NCAP 2016 directive to ease HEMS operations [12]. This case shows how strong political will and funding can rapidly deploy HEMS: it integrates helicopters into a broader EMS network (108 ambulances) and uses technology creatively. For India, Uttarakhand demonstrates a state-by-state model: with central encouragement (NCAP/UDAN) and a major health outlay, even a single state can build a life-saving air-EMS. Other Indian regions (like Andaman & Nicobar, or Ladakh) could emulate this approach, pairing helipads and helicopters with telemedicine and drones to cover their unique terrains.

Madhya Pradesh PPP EMS Model (IND)

Madhya Pradesh launched the PM Shri Air Ambulance Seva in mid-2024 as a free emergency airlift scheme. Under this program, the state government partnered with private firms (notably the NGO ICATT) to provide on-call air ambulance flights [10]. The service uses Airbus helicopters (on standby in key cities) to ferry critical patients to tertiary hospitals. Crucially, Ayushman Bharat cardholders are entitled to free evacuation nationwide, while other patients pay subsidized rates. Funding comes from the state health budget, with the central insurance scheme reimbursing costs. In its first months, MP's air ambulances have been flying 24/7, reaching remote districts like Bastar and Balaghat. The model is a classic PPP: government defines the mission (life-saving transport for the poor) and pays for it, while specialized air-EMS companies supply pilots and aircraft under contract. Early reports suggest good uptake but note logistical hurdles (e.g. contract execution, maintaining readiness). For India, Madhya Pradesh's example underlines that states need not own helicopters outright: outsourcing to a skilled private provider can rapidly create HEMS capability. The Ayushman-backed financing also demonstrates how health insurance schemes can subsidize air ambulances, a lesson India can carry forward.

SWOT Analysis

Strengths: India's large aviation sector and existing infrastructure support HEMS. The government has already signaled support (NCAP's HEMS facilitation, creation of UDAN airports). India also has strong emergency services (108/112 network), major hospital chains with HEMS units, and a cultural precedent for PPPs in EMS. Constitutional principles (right to life) and health policies provide a moral mandate. There is growing tech capacity (drones, GPS, telemedicine) and public awareness of EMS importance after recent disasters.

Weaknesses: Developing HEMS is costly: helicopters, maintenance, and trained crews are expensive. India's complex federal system means multiple agencies must coordinate (MoCA, DGCA, MoHFW, state health & transport departments). There is currently no unified EMS law or national EMS agency. Rural infrastructure is sparse (few helipads, limited landing zones). Many states lack health budgets for HEMS. Ground EMS services are uneven, which complicates integration. Public knowledge of using air ambulances is low, and insurance coverage is not comprehensive.

Opportunities: India can tap international aid (many countries fund EMS projects, like PH's US donors) and CSR funds to defray capital costs. Advances in drone tech and telemedicine (as tested in PH) can improve reach with less cost. India's experience (and PH's) provides models to adapt – we already know how Uttarakhand's scheme works. The recent expansion of regional airports (UDAN) offers new bases. Rising middle-class and insurers could market HEMS coverage. Also, scientific agencies (DRDO, ISRO) could partner on medevac tech.

Threats: High operational costs (fuel, pilots) could strain budgets. Safety risks (e.g. bad weather, pilots' error) are a concern in mountain flying. Political changes might divert attention from HEMS. Over-reliance on private operators can risk service continuity if contracts lapse. If early HEMS incidents (crashes or controversies) occur, public trust may suffer. Finally, catastrophes (cyclones, floods) might temporarily disrupt HEMS operations, so redundancy and military backup are needed.

Policy Recommendations

Legislative Action: Enact a national EMS law or scheme. India should follow PH's lead by formally codifying air ambulance services into law or an executive framework. The proposed Philippine EMSS Act would create a national EMS council and mandate 911 coverage; India could establish a

similar body under MoHFW or NHA to standardize EMS, assign funds, and liaise with DGCA. The PIL can invoke Article 21 (right to life) and Directive Principles (Art. 47) to argue the constitutional duty to provide emergency transport in underserved areas.

Barriers: Legislative reform in India is often slowed by competing parliamentary priorities, federal–state jurisdiction disputes, and potential resistance from stakeholders worried about cost-sharing.

Regulatory Framework: Direct DGCA/CAASL (our CAAP equivalent) to issue clear HEMS guidelines. These might mirror India’s NCAP relaxations: allow HEMS helicopters to operate point-to-point at low altitudes (no prior ATC clearance below 5000 ft), mandate medevac training for air crews, and streamline hospital helipad approvals. The Ministry of Health should designate HEMS as a category of ambulance service (like PH’s DOH AO definition), ensuring eligibility for health budgets. Create a fast-track approval for emergency flight plans.

Barriers: Regulatory harmonization between civil aviation and health ministries is complex, and bureaucratic silos may delay issuing unified guidelines. Safety concerns from aviation authorities may also slow implementation.

Infrastructure: Rapidly develop helipads at major hospitals (regional AIIMS, medical colleges) and designate flat areas for helicopter use. Equip key smaller airports for medevac operations (hangars, medical storage). Use funds (e.g. UDAN airport upgrades) to add services like fuel/flying hours for air ambulances. Collaborate with Ministry of Road Transport and local governments to ensure ground EMS and helipads coexist (e.g., DOH can incentivize city hospitals to build roof helipads by matching funds).

Barriers: High capital costs, lack of urban planning for helipad zoning, and limited technical expertise in hospital infrastructure upgrades may delay widespread implementation.

Integration: Form a unified national EMS dispatch. Establish or expand the 112 emergency line to cover all medical emergencies, linking police, fire, ground and air EMS. Create an Air-EMS Control Center (could start as a division of EMRI/108 centers) that receives calls, triages via telemedicine, and dispatches the nearest air ambulance. Equip aircraft with telemedicine kits (live video/ECG to hospital specialists). Adopt interoperable communication (satellite or VHF) so the flight team stays in contact with receiving hospitals. The central health portal should log all HEMS calls and patient outcomes for coordination and accountability.

Barriers: Integration requires inter-agency data-sharing, which may face institutional resistance. Ensuring nationwide telecom and satellite coverage for EMS communications is also a significant challenge in rural and mountainous areas.

Technology: Invest in state-of-the-art EMS tech. Mandate GPS-tracking and digital record-keeping on all air ambulances. Equip choppers with advanced on-board ICU kits (monitors, ventilators, blood warmers). Pilot a nationwide medical drone program (in partnership with ISRO/DIC projects) for critical supplies, building on PH’s mWell initiative. Use telemedicine: each HEMS flight should carry devices to consult hospitals mid-air. Develop mobile apps for EMS incident reporting and air-ambulance requests.

Barriers: High recurring costs, limited digital literacy among healthcare workers in rural areas, and data security concerns could delay adoption. Scaling drone programs will also require Civil Aviation regulatory approval and airspace coordination.

Public Awareness: Launch an outreach campaign. Publicize the new HEMS services and emergency number (112) through media and local health posts. Educate citizens and healthcare providers

about when to call an air ambulance (serious trauma, remote critical illness). Ensure transparency: publish yearly reports on HEMS usage and survival rates to build confidence. Work with community organizations in remote areas (tribal boards, fisherfolk councils) to inform them about fast EMS access.

Barriers: Reaching remote, underserved communities is difficult, and awareness campaigns often face linguistic and cultural barriers. Public skepticism about affordability of air ambulances may also limit uptake.

Monitoring and Evaluation: Set up KPIs: response time, patient survival, cost per life saved. Collect data from day one (as the WHO advises), comparing performance to WHO EMS benchmarks. Use the 112/HQ data to analyze coverage gaps and dispatch efficiency. Periodically audit contracts with private operators. Engage academic partners to evaluate outcomes and suggest improvements.

Barriers: Weak health information systems in some Indian states and reluctance of private operators to share operational data may hinder effective monitoring.

Regional Cooperation: Encourage inter-state and international collaboration. India might cooperate with ASEAN neighbors on medevac (joint exercises, mutual aid pacts). Invite Philippine or other regional air-EMS experts for training exchanges. In border areas, negotiate cross-border airlift agreements (e.g. Bhutanese medevacs under India's HEMS in exigency). Likewise, allow Philippine air ambulances to assist in South Asia disasters, fostering goodwill and shared learning.

Barriers: Regional coordination may face diplomatic hurdles, sovereignty concerns, and logistical issues with standardizing protocols across borders.

Legal Considerations

Indian Constitutional and Health Law Justifications

The Indian Constitution's Article 21 guarantees the right to life, which the Supreme Court has consistently interpreted to include access to timely emergency healthcare. This interpretation has been shaped by key Public Interest Litigations (PILs). In *Parmanand Katara v. Union of India* (1989), the Court ruled that every doctor, whether in a government or private hospital, has a professional obligation to provide immediate medical aid to an injured person, without waiting for legal or procedural formalities. Later, in *Paschim Banga Khet Mazdoor Samity v. State of West Bengal* (1996), the Court held that the failure of government hospitals to provide timely treatment to a seriously injured patient amounted to a violation of Article 21, and further established that the State cannot cite lack of resources as a justification for denying emergency care.

These PILs collectively reinforce the principle that timely access to life-saving treatment is a constitutional obligation. In the context of remote or disaster-prone regions, where ground transport is impractical or too slow, the absence of air-EMS can effectively amount to a denial of emergency care. Moreover, the Directive Principles of State Policy (Article 47) direct the State to raise the level of public health, providing additional normative weight to the argument that investment in Helicopter Emergency Medical Services (HEMS) is not optional but constitutionally mandated.

Therefore, a PIL advocating for a national air ambulance framework could build directly on *Parmanand Katara* and *Paschim Banga*, contending that failure to provide aerial evacuation in the "golden hour" violates the fundamental right to life under Article 21.

DGCA and Health Regulations Interfaces

In India, all HEMS aircraft must comply with DGCA regulations. Operators need a DGCA-issued Air Operator Certificate (for charter or non-scheduled service) and may require a specialized HEMS permit once rules are finalized. The DGCA can adopt standards for aircraft equipment and crew certification specific to medical flights (such as mandating a doctor on board for high-acuity cases). The Ministry of Health could issue guidelines recognizing certified air ambulances as part of the emergency health system; for example, the Philippine DOH's 2020 ambulance order explicitly included air vehicles. Coordination between agencies is key: for instance, DGCA and MoHFW might agree that certain helipads (hospital rooftops) get priority clearance. Liability and safety oversight should be shared – just as hospitals are regulated under health laws, aircraft are overseen under aviation laws. Any new EMS legislation could specify how CAASL and health authorities jointly inspect HEMS operations. Finally, insurers and Arogya schemes must be legally enabled to reimburse HEMS costs; this likely requires notifications under the IRDA and the Ayushman Bharat legal framework to treat airlift as a covered emergency service.

Conclusion

The India–Philippines comparison reveals both shared challenges and opportunities. India's geography and population size demand a robust HEMS network, and India is well-placed to implement it given existing resources and policies. The Philippines' experience – though it has a smaller system – offers valuable insights: innovative PPPs, early regulatory steps, and tech pilots demonstrate how to stretch limited resources for maximum impact. By heeding these lessons and embedding air ambulances into its health infrastructure, India can transform emergency care in remote regions.

A PIL advocating a national air-EMS can cite India's constitutional duty and examples like Uttarakhand and Madhya Pradesh's programs as evidence that expansion is both feasible and necessary. Ultimately, timely investment in helicopters, training, and systems (backed by law and budget) will ensure that critical medical care truly reaches all Indian citizens within the golden hour.

To measure the success of such policies, India should adopt clear metrics. These may include:

- **Response Time Benchmarks:** percentage of patients in remote regions reaching tertiary care within the golden hour.
- **Health Outcomes:** reductions in preventable trauma or maternal deaths due to delayed transport; survival-to-discharge rates of airlifted patients.
- **Coverage and Equity Indicators:** proportion of underserved districts (tribal, island, mountainous) with operational air-EMS access.
- **Cost-Effectiveness Metrics:** cost per life saved or per patient stabilized compared to ground EMS in remote contexts.
- **System Integration Measures:** percentage of HEMS calls routed through the unified 112/108 system, and interoperability with insurance schemes such as Ayushman Bharat.

Embedding such success metrics will allow policymakers, courts, and the public to hold the system accountable, ensuring that air-EMS is not just deployed but delivers tangible improvements in survival, equity, and efficiency.

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Acronyms

EMS – Emergency Medical Services
HEMS – Helicopter Emergency Medical Service (air ambulance by helicopter)
HPSR – Health Policy and Systems Research
DOH – Department of Health (Philippines)
CAAP – Civil Aviation Authority of the Philippines
NCAP – National Civil Aviation Policy
MIMAROPA – Mindoro, Marinduque, Romblon, and Palawan (Philippines region)
MoCA – Ministry of Civil Aviation (India)
DGCA – Directorate General of Civil Aviation (India)
UDAN – “Ude Desh ka Aam Nagrik” (India’s Regional Connectivity Scheme)
UHC Act – Universal Health Care Act (Philippines, RA 11223)
PPP – Public–Private Partnership
AIIMS – All India Institute of Medical Sciences (India)
ICATT – International Centre for Air Ambulance Transportation (Indian private EMS provider)
NGO – Non-Government Organization
PIL – Public Interest Litigation
Govt – Government
MOA – Memorandum of Agreement
PAMAS – Philippine Adventist Medical Aviation Services
PGH – Philippine General Hospital
PMJAY – Pradhan Mantri Jan Arogya Yojana (Ayushman Bharat scheme, India)
MoHFW – Ministry of Health and Family Welfare (India)
NDRF – National Disaster Response Force (India)
NDMA – National Disaster Management Authority (India)
DOTr – Department of Transportation (Philippines)
AOC – Air Operator Certificate
AFP – Armed Forces of the Philippines
NDRMC – National Disaster Risk Reduction and Management Council (Philippines)
PPE – Personal Protective Equipment
Health-EDRM – Health Emergency and Disaster Risk Management

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