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DRONES: Unmanned Delivery of Health and Hope

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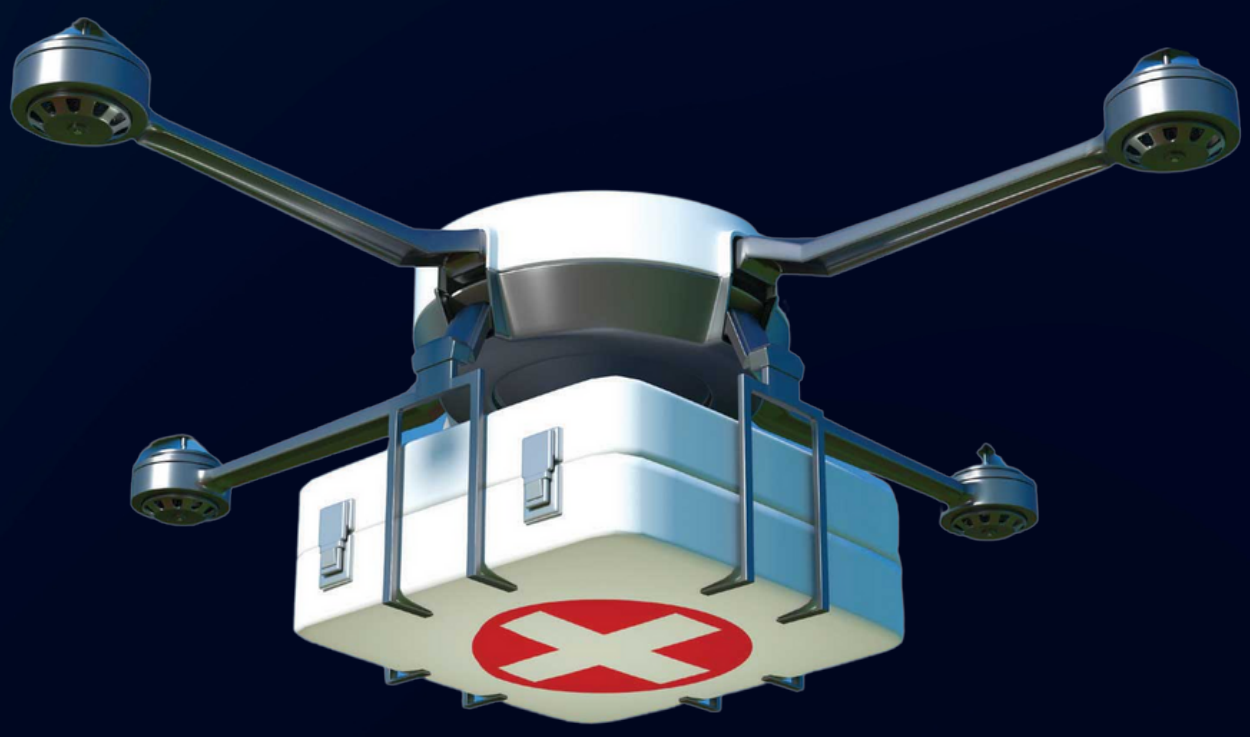
Drones: Here, There and Everywhere

While COVID-19 pandemic has put exceptional strain on contemporary healthcare systems, the industry's reaction has proven its robustness and capacity to bring innovations to the markets swiftly

Drone or UAV (Unmanned Aerial Vehicle), is one such breakthrough that is poised to play a pivotal role in the future of healthcare



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Evolution of Drone Technology

2000s — **Raven, Wasp,** & **Puma**: small fixed-winged drones launched

2014 — Prototype for **Ambulance Drone** created by a Dutch student

2016 — **Flirtey** made 1st FAA-approved delivery in a US urban area

2017 — Flirtey & **REMSA** joined hands to deliver **1st automated external defibrillator (AED)** in US

2019 — UPS began delivering medical samples in US, using **Matternet-built drones**

2020 — COVID-19 pandemic gave a huge boost to drone industry in the interest of reducing contact points

2021 — Alliance bw Zipline, Pfizer, & BioNTech paves way for **world's 1st long-distance drone delivery of vaccinations** requiring ultra-cold-chain storage

Source: News18, Drone Tech Planet

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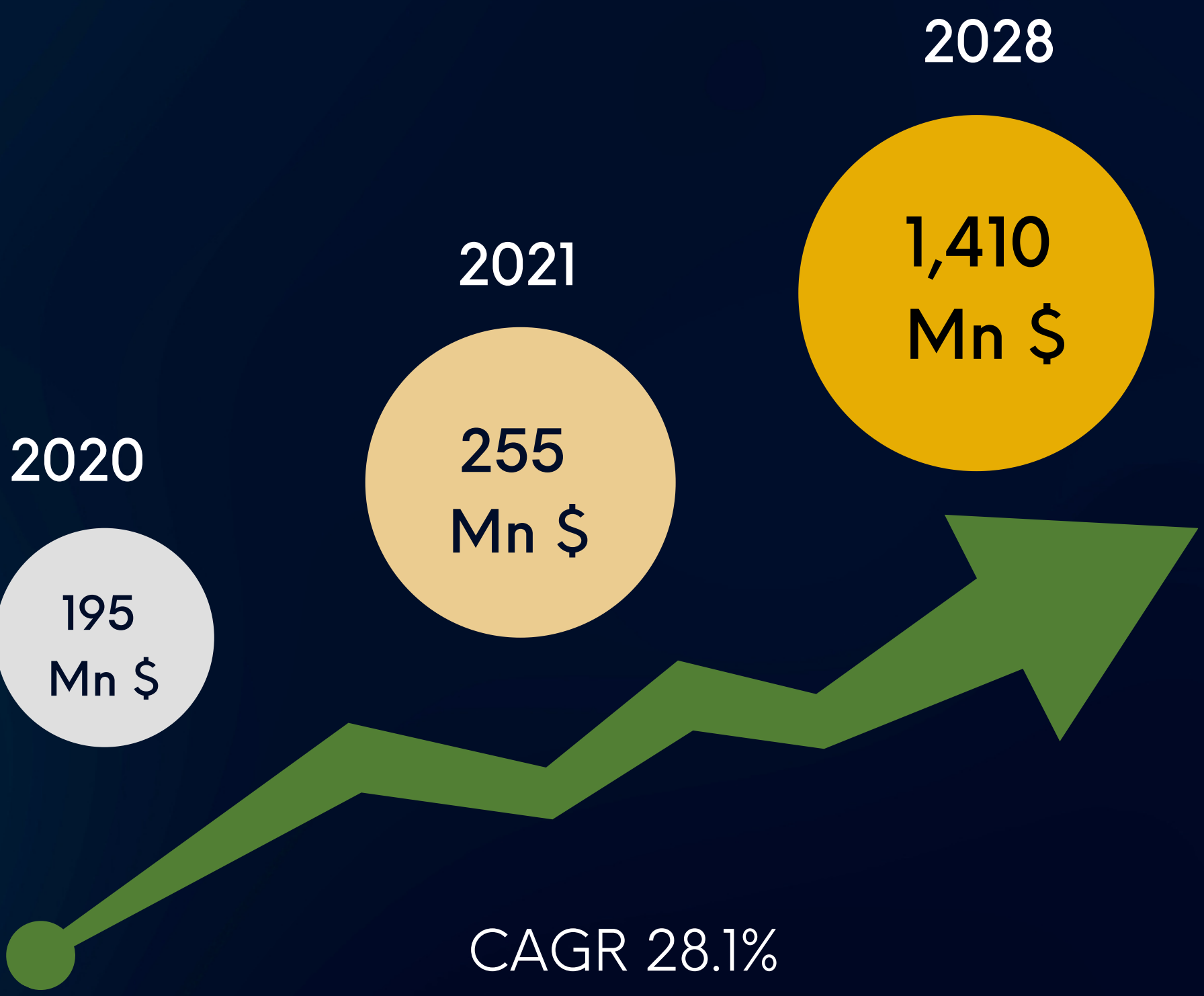
Medical Drone Market is Booming Worldwide



CAGR 28.1%
(2020-2028)

Blood bank segment is expected to lead this market during forecast period

Source: Fortune Business Insights

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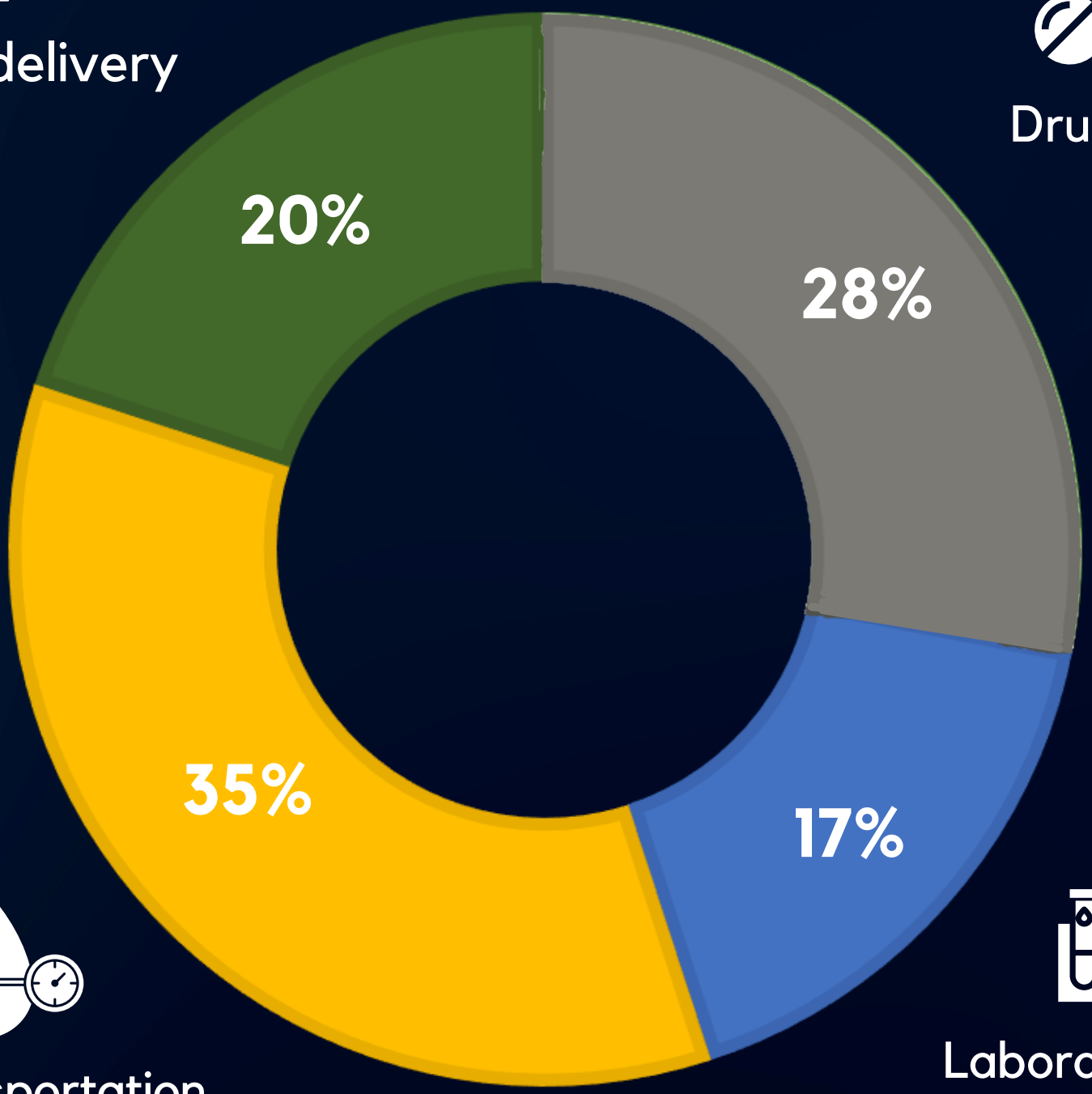
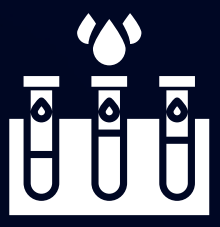
Application of Medical Drones

Vaccine delivery

Drug supply



Blood Transportation



Laboratory sample Transportation

Source: UPS Healthcare

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Growth Drivers

Drones for medical purposes are in great demand, which is fueling their adoption

Increased demand for contactless devices

Growing demand for **B**eyond **V**isual **L**ine **O**f **S**ight (BVLOS) for logistic operations

Rising participation of governments

Increasing concept of security & surveillance in public places

Increasing R&D expenditure

Adoption of telemedicine

Public acceptance

Source: Healthcare Transformers

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Challenges and Constraints

Lack of unified Air Traffic Management could hamper growth

Payload capacity

Security for controlled substances

Maintaining integrity of specimens during delivery:

- Temperature control
- Need for special equipment packaging

Major issue is reducing operational hurdles & drone-related accidents that BVLOS flights experience

Battery life

Regulations; Federal, state & local (All must agree on operational procedures)

Source: Healthcare Transformers

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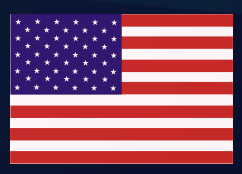
Regulations Governing Drone Operations are Continuously Evolving



USA

- **Federal Aviation Administration (FFA)** must be involved. Since a hazardous and medical material like blood may be the cargo, Department of Transportation and **US FDA** are also involved
- To fly a drone for commercial purposes it is mandatory to obtain a **'Remote Pilot Certificate'** from the **FAA**
- **Level of safety** that must be demonstrated by a drone is dependent on the density of the population below the fly zone
- Regulators think of this as a density limitation with respect to risk. Low population minimizes risk of unexpected incidents
- Next level of higher population density would require higher levels of safety experience and proof by the **UAV operator**

Source: Drone laws in US

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India Recently Changed Drone Regulations, Lowering Red Tape

INDIA

- Agencies in charge of regulating drones are:-
  - India Ministry of Civil Aviation (MoCA)
  - Directorate General of Civil Aviation (DGCA)

- To fuel growth of drone sector, GOI recently introduced **"Drone Rules 2021"** to facilitate cheaper & easier drone operations

- Effective from **August 2021**, new policy provides a plethora of opportunities. Key highlights:-
  - Drone coverage increased from 300 kg to 500 kg
  - No need of certificate of airworthiness, unique identification number, prior permission & remote pilot license for entities engaged in R&D on drones
  - Foreign enterprises registered in India can import & operate drones and their parts. These will be regulated by DGFT

- **Digital Sky Platform,** hosted by DGCA, to function as a single-window system, simplifying the process of drone registration

Source: The Drone Rules 2021

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Companies Betting Big on Drones

Global Companies

MANNA

VAYU

MATTERNET

FLYTREX

zipline

Flirtey
anything anytime anywhere

SKYFARE

VOLANSI

Skyports

Swoop Aero

Indian Companies

MARUT
- DRONES -

DRONES
TECHLAB

grene
ROBOTICS

SKYLARK™
DRONES

ideaForge™
Create. Inspire

Aero360

SKYE AIR

1M

Source: Fortune Business Insights, Economic Times