Automatic Healthcare Continuity: A Post-Disaster Pharmacy-Based System for Chronic Disease Management in Jamaica and Beyond

A White Paper on Emergency Prescription Access and Protocol-Based Care

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Executive Summary

Jamaica's vulnerability to hurricanes demands a revolutionary approach to chronic disease management during disasters. The evidence is unequivocal: when medication access fails, people with chronic illnesses die. Hurricane Maria killed nearly 3,000 people in Puerto Rico—not primarily from wind or flooding, but largely from interrupted care for diabetes, heart disease, and other manageable conditions. Hurricane Melissa in October 2025 devastated Jamaica's western healthcare infrastructure, exposing critical gaps in the island's ability to maintain chronic disease care during emergencies.

This white paper proposes an integrated Post-Disaster Healthcare Continuity System that transforms pharmacies into frontline healthcare hubs activated automatically when disaster strikes. The system leverages electronic prescription records held at pharmacies, emergency legislation enabling pharmacist-initiated chronic medication dispensing, protocol-based treatment for common disaster-related complications, and motorcycle-based delivery networks to reach vulnerable patients who cannot access traditional healthcare settings.

The proposed framework addresses a preventable crisis: post-Hurricane Melissa, communications were down, physicians' offices were inaccessible, some practitioners had departed overseas, and patients with chronic illnesses—particularly the elderly and mobility-impaired—suffered due to lack of access to their primary healthcare providers. This led to overcrowding of hospitals and clinics with stable chronic disease patients who simply needed medication refills, diverting resources from acute emergency needs.

The solution is a pre-positioned system that is not affected by disaster but is instead triggered by disaster to ensure continuity of care until further assessment is made.

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1. Introduction: The Healthcare Continuity Crisis

1.1 The Problem Statement

Natural disasters create immediate healthcare emergencies—injuries, drownings, trauma. But the longer-term health toll often exceeds the acute phase, as patients with chronic conditions lose access to the medications and

monitoring that keep them stable. This secondary crisis is entirely preventable with proper pre-positioning of healthcare continuity systems.

Hurricane Melissa's impact on Jamaica in October 2025 illustrated this vulnerability with devastating clarity:

- Communications infrastructure collapsed, preventing patients from contacting physicians
- Many physicians' offices were damaged or inaccessible due to road conditions
- Some healthcare providers departed the affected areas
- Patients with chronic illnesses—diabetes, hypertension, heart disease, asthma—could not access regular medications
- Hospitals and clinics became overwhelmed with stable chronic disease patients seeking medication refills
- Diabetic patients with hurricane-related injuries faced compounded risks: wounds prone to infection combined with uncontrolled blood glucose levels

The result was predictable: exacerbation of chronic conditions, preventable complications, and strain on emergency healthcare resources that should have been reserved for acute needs.

1.2 The Preventable Cascade

Consider the diabetic patient post-hurricane:

1. **Medication loss:** Hurricane destroys home, including medication supply
2. **Access barriers:** Cannot reach physician due to communications failure and road damage
3. **Blood glucose dysregulation:** Without medication, blood sugar levels rise uncontrolled
4. **Injury risk:** Cleanup activities involve debris, creating wound risk
5. **Infection vulnerability:** Elevated blood glucose impairs immune function and wound healing
6. **Progression:** Minor wound becomes infected, progresses to diabetic foot ulcer
7. **Severe outcome:** Without intervention, amputation may be required

This cascade—repeated across thousands of patients with various chronic conditions—is entirely preventable if medication continuity systems activate automatically when disaster strikes.

1.3 The Proposed Solution

This white paper proposes a **Post-Disaster Healthcare Continuity System** comprising:

1. **Electronic Prescription Infrastructure:** Cloud-based prescription records accessible from any location, with copies held at pharmacies

2. **Emergency Pharmacist Authority:** Legislation automatically triggered by disaster declaration enabling pharmacists to independently dispense chronic medications
3. **Protocol-Based Treatment:** Pre-approved treatment protocols for common disaster-related complications, authorized for pharmacist and emergency healthcare provider implementation
4. **Medication Delivery Network:** Organized motorcycle-based delivery service ensuring vulnerable patients receive medications at home
5. **Coordination Framework:** Integration with national disaster management systems for seamless activation

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2. Evidence Base: The Deadly Toll of Medication Interruption

2.1 Hurricane Maria: A Case Study in Healthcare System Failure

The health consequences of disrupted chronic disease care during disasters are catastrophic and well-documented. Hurricane Maria caused an estimated 2,975 excess deaths in Puerto Rico over six months—a figure 46 times higher than the initial official count of 64. Analysis reveals that 253 deaths were from heart disease and 195 from diabetes, conditions entirely manageable with continuous medication access.

The most vulnerable populations faced the greatest risks: elderly residents of the poorest municipalities experienced 60% higher mortality risk than expected. This was not a natural disaster death toll in the traditional sense—it was a healthcare system failure measured in lives.

2.2 Hurricane Katrina: Chronic Disease Interruption Patterns

Hurricane Katrina research documented similar patterns:

- **73.9% of survivors** had at least one chronic condition
- **20.6% cut back or terminated treatment** because of the disaster
- Among those who stopped treatment, 41% cited lack of access to physicians and 32.5% cited inability to obtain medications
- Diabetic patients saw A1C levels climb from 7.7% to 8.3% post-Katrina
- Blood pressure readings spiked across all studied healthcare systems
- Survivors lacking medications had **2.8 times higher odds of post-traumatic stress** four years later

2.3 Physiological Consequences of Medication Interruption

The clinical consequences of medication interruption are severe and rapid:

- **Insulin-dependent diabetics:** Can develop ketoacidosis within 24 hours without treatment, with 5% mortality in elderly patients
- **Dialysis patients:** Face life-threatening complications within days
- **Heart disease patients on anticoagulants:** Risk stroke and cardiac events
- **Hypertension patients:** Blood pressure spikes increase stroke and heart attack risk
- **Asthma/COPD patients:** Respiratory exacerbations can be fatal without maintenance medications

2.4 Pharmacy Access During Disasters

During Hurricane Maria, only 29% of Puerto Rico's pharmacies remained open five days after landfall. Patients faced cascading barriers:

- No power for refrigerating insulin
- No phones to reach physicians for prescription renewals
- No ATMs for copayments
- No records of prescriptions at functioning pharmacies
- Transportation barriers to reach open pharmacies

Federal disaster relief teams after Hurricane Katrina supplied only 9% of chronic care medications while retail pharmacies provided 73%—demonstrating that pharmacy infrastructure is already the primary medication access point during emergencies.

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3. Jamaica's Chronic Disease Vulnerability

3.1 Epidemiological Profile

Jamaica carries one of the Caribbean's highest burdens of chronic disease:

- **30% of adults over 30** have hypertension
- **12.4% prevalence** of diabetes
- Among Jamaicans aged 60 and older: **61.4% hypertension prevalence** and **26.3% diabetes**
- Non-communicable diseases account for **78% of all deaths** in Jamaica
- Diabetes is a leading cause of lower limb amputations

3.2 National Health Fund Infrastructure

The **National Health Fund (NHF)** serves as the backbone of chronic disease medication access in Jamaica:

- Provides subsidies for **24 chronic conditions** including diabetes, hypertension, asthma, and cardiovascular disease
- In 2024, filled **2.7 million prescriptions** for **700,000 Jamaicans**
- Dispensed **$9.1 billion JMD** in subsidies
- Operates through **477 participating pharmacies** and **106 public Drug Serv locations**
- **Drug Serv** program provides free medications for enrolled beneficiaries

This infrastructure represents both an asset and a vulnerability—it concentrates chronic disease medication access in systems that could collapse during a major hurricane, but also provides a foundation for emergency continuity systems.

3.3 Hurricane Melissa Impact (October 2025)

Hurricane Melissa's Category 5 impact on Jamaica demonstrated chronic disease vulnerabilities:

- **Five major hospitals** severely damaged
- **Black River Hospital** destroyed entirely, requiring emergency field hospital deployment
- All health centers in affected areas closed
- Leptospirosis outbreak followed, claiming at least six lives
- PAHO launched **US$14.2 million donor appeal** and deployed emergency medical teams
- Stable chronic disease patients forced into overwhelmed emergency settings or went without care

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4. Electronic Prescription Infrastructure

4.1 Current State: Jamaica's E-Care System

Jamaica's transition to electronic health records offers a foundation for disaster-resilient medication access, though significant gaps remain:

- **E-Care system** implemented through 15-year contract with UK firm The Phoenix Partnership (TPP)
- Uses **SystmOne platform** under "one patient, one record" philosophy
- As of June 2025, **only 13 health facilities** have gone live with electronic records

- Includes May Pen Hospital, Spanish Town Hospital, St. Ann's Bay Hospital, and several health centers

4.2 The Disaster Resilience Value of Electronic Records

Cloud-based prescription systems provide critical disaster resilience benefits demonstrated elsewhere:

- **Hurricane Sandy:** Long Beach Medical Center's cloud-hosted EHR remained accessible even after 10 feet of flooding destroyed the facility—staff relocated and continued accessing records remotely within hours
- **Hurricane Katrina:** VA electronic systems enabled continuity for nearly 15,000 patients, with clinical data accessed at over 200 sites across 48 states
- **KatrinaHealth.org:** Created database of 7 million prescriptions accessible by 25,000 pharmacies nationwide within weeks

4.3 Technical Requirements for Disaster-Resilient Prescription Systems

Key technical requirements include:

- **3-2-1 backup approach:** Three copies, two media types, one offsite
- **Geographic redundancy:** Data centers in different disaster risk zones
- **Near-zero recovery point objectives** for prescription data
- **AES 256-bit encryption** for data security
- **Offline capability:** Local caching for periods of connectivity loss
- **Multi-modal access:** Web, mobile, and SMS-based query options

4.4 Expanding the NHF Digital Footprint

The NHF's existing digital assets provide building blocks:

- **Quick Prescript smartphone application:** Allows patients to photograph and submit prescriptions electronically
- **Drug Serv enrollment database:** Contains diagnosis and prescription histories for 350,000+ beneficiaries
- **Pharmacy network connectivity:** 477 participating pharmacies already connected to NHF systems

These assets could form the nucleus of an emergency prescription continuity system with targeted enhancement.

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5. Emergency Pharmacist Authority Framework

5.1 International Precedents

Legal frameworks enabling pharmacists to provide expanded services during emergencies exist throughout the United States and internationally:

Federal Level (United States):

- **PREP Act (Public Readiness and Emergency Preparedness Act):** Repeatedly amended to expand pharmacist authority
- Currently allows pharmacists to order COVID-19 therapeutics and prescribe Paxlovid
- PREP immunity extends through December 2029 for COVID-19 countermeasures

State-Level Emergency Orders:

- **Florida:** Automatic activation upon governor's emergency declaration enables pharmacists to dispense up to 30-day emergency refills of maintenance medications without prescriber authorization, plus 72-hour emergency supplies or one vial of insulin when prescribers cannot be contacted
- **California (2025 Palisades Fire):** Authorized pharmacists to furnish dangerous drugs without prescriptions to protect public health, deploy mobile pharmacies, and dispense controlled substances without standard prescription form requirements

5.2 Collaborative Practice Agreements

Collaborative Practice Agreements (CPAs) for chronic disease management are now authorized in 48 U.S. states, enabling pharmacists to initiate, modify, and monitor therapy under physician-approved protocols.

Documented outcomes include:

- **Asheville Project:** $1,622–$3,356 net savings per patient annually with 50% reduction in sick days
- **UK Independent Prescribing Model (2006):** Allows pharmacists to prescribe autonomously within their competence
- **Cochrane Review (46 studies):** Found comparable clinical outcomes to medical prescribers

5.3 Proposed Jamaica Framework

Jamaica's **Disaster Risk Management Act of 2015** establishes the Office of Disaster Preparedness and Emergency Management (ODPEM) and grants the Prime Minister authority to declare disaster areas. This

existing structure provides legal scaffolding for emergency pharmacist scope expansion.

Proposed Automatic Triggers:

Upon declaration of a disaster affecting healthcare infrastructure:

1. **Immediate (0-72 hours):** Pharmacists authorized to dispense emergency refills of any chronic medication for which patient has documented prescription history
2. **Short-term (72 hours - 2 weeks):** Pharmacists authorized to continue chronic medication management under standardized protocols
3. **Extended (2+ weeks):** Collaborative practice agreements activated for ongoing chronic disease management until primary care access restored

Liability Protections:

Good Samaritan provisions modeled on U.S. PREP Act should provide immunity for pharmacists acting in good faith under emergency authority.

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6. Protocol-Based Treatment for Disaster-Related Complications

6.1 Rationale for Protocol-Based Care

Post-disaster, patients face not only medication interruption but also new health challenges:

- **Injuries from debris:** Cuts, punctures, lacerations during cleanup
- **Infection risk:** Contaminated water, compromised wound care
- **Chronic disease complications:** Diabetic wounds healing poorly due to uncontrolled glucose
- **Exacerbations:** Asthma attacks from dust and debris, hypertensive crises from stress

Protocol-based care enables trained healthcare providers—pharmacists, nurses, emergency medical technicians—to address these complications using pre-approved treatment algorithms without requiring physician consultation for each decision.

6.2 Diabetes Management Protocols

Pharmacist diabetes management protocols enable:

- Ordering A1C and glucose testing
- Initiating and modifying oral diabetes medications

- Adjusting insulin dosing according to blood glucose patterns
- Wound assessment for diabetic patients

Evidence: Meta-analyses show pharmacist-managed diabetes programs achieve 1.0–2.8% A1C reductions, with patients at baseline A1C above 9% showing the greatest benefit.

6.3 Hypertension Management Protocols

Under physician-pharmacist collaborative management:

- Average of 4.9 medication changes versus 1.1 in usual care
- **74% of patients achieving blood pressure control at 12 months**
- WHO HEARTS protocol provides simplified algorithms for first-line agents

6.4 Wound Care and Infection Protocols

For wound care—critical given diabetic foot ulcer risk in disaster conditions:

- Assessment using Wagner classification system
- Dressing selection based on wound characteristics
- Antibiotic selection for infected wounds following Wound Healing Society guidelines
- First-line oral antibiotics: amoxicillin-clavulanate, trimethoprim-sulfamethoxazole
- Defined referral criteria for severe infections requiring higher-level care

6.5 Test-and-Treat Protocols

Virginia, Kentucky, and other states authorize pharmacist treatment of uncomplicated conditions using rapid testing:

- **Urinary tract infections:** CLIA-waived urine dipstick testing with first-line antibiotics
- **Strep throat:** Rapid strep test with appropriate antibiotic therapy
- **Influenza:** Rapid flu test with antiviral dispensing

These protocols could be adapted for Jamaica's disaster response context.

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7. Medication Delivery Network

7.1 The Last-Mile Challenge

Reaching patients when roads are damaged and vehicles scarce represents a critical challenge. Vulnerable chronic disease patients—elderly, mobility-impaired, those in remote areas—cannot travel to pharmacies even when pharmacies are operational.

7.2 Motorcycle-Based Healthcare Delivery: International Models

Riders for Health (Africa):

- Operates across seven African countries
- Manages over **1,700 vehicles** reaching **21.49 million people**
- Health workers on motorcycles reach **four times farther** and see **six times more patients** than those without transport
- Stanford-Zambia study: Systematic motorcycle fleet management increased outreach trips by 0.9 per week per health worker and village-level patient visits by **20.5 per week**
- Emphasizes preventive maintenance and "zero breakdown" operations

Motorcycle Ambulances:

- Proven effective in Brazil, Kenya, Uganda, Tanzania, and Thailand
- Navigate flood-damaged roads and mountainous terrain where four-wheeled vehicles cannot pass
- Lower purchase and operating costs than four-wheeled vehicles

7.3 Jamaica's Existing Delivery Infrastructure

Jamaica has nascent pharmaceutical delivery infrastructure:

- **NHF home delivery service (April 2020):** For Drug Serv patients aged 65 and older in St. Thomas, Kingston, St. Andrew, St. Catherine, and Manchester
- **Private pharmacy delivery:** ValuDrug, J&J Pharmacy, and others offer prescription delivery services
- **NHF Mobile Dispensing Unit:** Already deployed for underserved areas

7.4 Proposed Disaster Medication Delivery System

Fleet Composition:

- Dedicated motorcycle fleet for medication delivery during emergencies
- Riders trained in medication handling, patient verification, and cold chain management
- GPS tracking for route optimization and delivery confirmation

Cold Chain Management:

- Insulated containers with phase-change materials maintain appropriate temperatures for 24-35 hours
- Research shows human insulin maintains stability for up to six months at 25°C and two months at 37°C with less than 10% potency loss

Operational Model:

- Pre-registered vulnerable patients with verified addresses and contact information
- Automatic activation upon disaster declaration
- Coordination with NHF and pharmacy network for medication sourcing
- Delivery confirmation and patient status reporting

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8. Vulnerable Population Identification and Outreach

8.1 Vulnerability Mapping

Proactive identification of vulnerable chronic disease patients is essential for effective emergency response. CDC data shows:

- **80% of adults over 65** have at least one chronic illness
- **50% have two or more conditions**
- Elderly residents with mobility limitations are **2.6 times more likely** to experience transport-delayed care
- Living alone correlates with lower odds of having emergency preparedness supplies

8.2 International Models for Vulnerability Registries

HHS emPOWER Program (United States):

- Covers **4.6 million Medicare beneficiaries** who rely on electricity-dependent equipment
- Provides de-identified data at ZIP code level publicly

- More granular data available to public health authorities during emergencies

State At-Risk Registries:

- Louisiana's AtRisk Registry (developed post-Katrina): Cloud-based HIPAA-compliant tracking of patient status, location, and medical needs
- County-level programs integrate with CodeRED emergency notification systems

8.3 Jamaica Registry Proposal

Jamaica could adapt these approaches using existing NHF enrollment data:

- **Baseline registry:** 350,000+ NHF beneficiaries with diagnosis and prescription information
- **Vulnerability scoring:** Based on age, number of chronic conditions, medication complexity, mobility status, living situation
- **Geographic mapping:** Identify concentrations of vulnerable patients by community
- **Communication preferences:** Phone, SMS, community health worker visit

8.4 Community Health Worker Integration

Community health workers play essential roles in disaster response:

- Health promotion and chronic disease management support
- Cultural bridge-building with underserved communities
- Disaster-specific roles: Mental health first aid, triage assistance, resource linkage
- Patient status verification and medication delivery coordination

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9. System Integration and Coordination

9.1 Legal Framework Requirements

Emergency Pharmacy Practice Legislation:

- Automatic scope expansion upon disaster declaration
- Tiered authority levels: routine CPAs, emergency refills, full disaster prescribing
- Good Samaritan liability protections

- CARICOM reciprocity provisions for volunteer health practitioners

Amendments to Pharmacy Council Regulations:

- Pre-approved emergency protocols
- Training and certification requirements
- Documentation standards for emergency dispensing

9.2 Technical Infrastructure Priorities

1. **Accelerate E-Care EHR deployment** beyond current 13 facilities
2. **Cloud-based prescription database** with geographic redundancy
3. **Satellite communication systems** (Starlink or VSAT terminals) for healthcare facilities
4. **Expand Quick Prescript application** capabilities for emergency ordering
5. **Pharmacy network resilience:** Backup power, satellite connectivity for key pharmacies

9.3 Operational Coordination

Integration with ODPEM:

- Healthcare continuity system embedded in National Disaster Response Plan
- Automatic activation triggers aligned with disaster declaration levels
- Coordination protocols with Emergency Operations Centers
- Pharmacy locations designated as priority relief locations with requisite support for immediate repairs, communication re-establishment, electricity supply, road clearing, and other infrastructure restoration to ensure rapid return to operational status

Ministry of Health Emergency Operations:

- Real-time dashboard of pharmacy operational status
- Medication inventory tracking across pharmacy network
- Patient status reporting from delivery network

NHF Coordination:

- Emergency authorization for expanded dispensing
- Inventory release from central supplies

- Financial authorization for emergency medication procurement
- Pre-disaster medication sourcing and geographic staging/positioning based on early warning systems, ensuring critical chronic disease medications are pre-positioned in vulnerable areas before hurricane impact

9.4 Training Requirements

Pharmacists:

- Basic disaster life support
- FEMA NIMS certification (or Jamaica equivalent)
- Chronic disease management protocols
- Emergency dispensing documentation

Delivery Personnel:

- Route navigation for damaged infrastructure
- Patient identification and verification
- Cold chain management
- Communication protocols for network outages

Community Health Workers:

- Mental health first aid
- Disaster triage basics
- Resource navigation
- Patient status assessment and reporting

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10. Economic and Health Impact Analysis

10.1 Cost of Inaction

The economic burden of medication interruption includes:

- Emergency department visits for preventable chronic disease exacerbations

- Hospitalizations for complications (diabetic ketoacidosis, hypertensive crisis, asthma exacerbations)
- Long-term complications (amputations, stroke, kidney failure)
- Mortality costs (life-years lost, family economic impact)

10.2 Cost-Effectiveness of Proactive Systems

Evidence supports proactive chronic disease management as cost-effective:

- **Asheville Project:** Net savings of $1,622–$3,356 per patient per year through pharmacist-managed chronic disease care
- **Emergency Prescription Assistance Program (EPAP):** Processed 17,589 claims for 2,339 individuals in U.S. Virgin Islands after Hurricane Maria
- **WHO estimates:** 20-40% of healthcare budgets go to equipment and medicines, with supply chain inefficiencies causing 15% waste

10.3 Investment Requirements

Initial Investment:

- Electronic prescription system enhancement
- Satellite communication equipment for key pharmacies
- Motorcycle fleet acquisition and training
- Protocol development and pharmacist training
- Vulnerability registry development

Ongoing Costs:

- Fleet maintenance and fuel
- Training updates
- System maintenance
- Coordination staff

Return on Investment:

- Reduced emergency department utilization
- Prevented hospitalizations

- Avoided long-term complications
- Lives saved

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11. Implementation Roadmap

Phase 1: Foundation (Months 1-6)

- Draft emergency pharmacy practice legislation
- Develop standardized treatment protocols with Pharmacy Council and Medical Association
- Design vulnerability registry structure
- Identify pilot parishes for initial deployment

Phase 2: Infrastructure (Months 6-12)

- Deploy satellite communication to pilot pharmacies
- Establish cloud-based prescription backup system
- Procure and position motorcycle fleet
- Train pharmacists and delivery personnel

Phase 3: Pilot Testing (Months 12-18)

- Conduct tabletop exercises with ODPEM
- Test activation procedures in pilot parishes
- Refine protocols based on simulation experience
- Build vulnerability registry in pilot areas

Phase 4: Full Deployment (Months 18-24)

- Expand to all parishes
- Complete vulnerability registry
- Integrate with national disaster response systems
- Conduct full-scale exercise

Phase 5: Continuous Improvement (Ongoing)

- After-action reviews following any activation
- Protocol updates based on experience
- Technology upgrades
- Training refreshers

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12. Conclusion: A Preventable Crisis

Hurricane Melissa demonstrated that Jamaica's chronic disease patients face preventable harm when healthcare systems fail during disasters. The proposed Post-Disaster Healthcare Continuity System addresses this vulnerability through:

1. **Electronic prescription records** accessible from any location
2. **Emergency pharmacist authority** activated automatically by disaster declaration
3. **Protocol-based treatment** for chronic disease management and common complications
4. **Motorcycle delivery networks** reaching vulnerable patients at home
5. **Coordinated activation** integrated with national disaster management

Every component has been proven elsewhere: pharmacist scope expansion in Florida and California, motorcycle healthcare delivery in Africa, protocol-based chronic care management across the United States, and electronic prescription portability after multiple hurricanes.

The cost of inaction is measured in lives lost to entirely preventable causes. Jamaica has an opportunity to demonstrate that small island developing states can lead in disaster healthcare innovation, protecting their most vulnerable citizens while providing a model for the Caribbean region and beyond.

The system I propose here is not affected by disaster—but instead, it is triggered by disaster to ensure continuity of care until normal healthcare access is restored. This paradigm shift from reactive emergency response to proactive healthcare resilience represents my vision for the future of disaster medicine in Jamaica.

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This white paper was prepared by the Disaster Resilience Coordination Institute to advance development of post-disaster healthcare continuity systems for chronic disease patients. The evidence demonstrates that proactive pharmacy-based medication continuity systems can prevent the preventable deaths that occur when chronic disease patients lose access to care during disasters.