

WG 1 (Chemical, Biological, Radiological and Nuclear materials)

## AHAK – A New Medical Countermeasure Against Percutaneous Intoxication by Low Volatility (Persistent) Organophosphorus Nerve Agents

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Low volatility organophosphorus chemical warfare agents (OP CWAs) such as VX and Novichok, are potent cholinesterase inhibitors that can easily penetrate the skin, creating a dermal depot from which the agent gradually penetrates the bloodstream. This results in prolonged cholinergic overstimulation, which can be fatal if not properly treated. Current countermeasures are not suitable for neutralizing the dermal depot. Accordingly, we developed the potassium salt of acetohydroxamic acid (AHAK), as a “catch-up” therapy lotion intended to penetrate the skin and neutralize the low volatility OP CWA dermal depot by decomposing it. Our results demonstrate the efficacy of combining dermal application of the AHAK lotion, together with standard antidotal treatment against OP CWAs poisoning, in protection against dermal exposure to low volatility OP CWAs in an unanesthetized swine model. Specifically, our results show that the combined treatment provided complete rescue of all exposed animals and significantly reduced the recurrence of intoxication signs, leading to a significant shortening of the medical supervision duration required. Hence, our results provide the first demonstration of the efficacy of a “catch-up” therapy in protection against low volatility OP CWAs dermal exposure and delineate the AHAK lotion as an effective such therapy.

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## A Threat Classification Model Based on National Risk Levels

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Israel's National Health Intelligence Agency was established post COVID-19 pandemic to enhance early detection and response to public health threats. It supports risk-based decision-making, detecting outbreaks, assessing risks, and guiding strategic actions. A structured threat classification model is essential for shifting from reactive to proactive public health management.

### **Purpose:**

To develop a standardized model for classifying public health threats based on national risk levels and potential disease importation.

### **Methods:**

The model evaluates five key factors:

1. Anomaly detection – Identifying unusual health events.
2. Severity assessment – Mortality and transmissibility.
3. Population vulnerability – Immunization levels, healthcare burden.
4. National preparedness – Policies, stockpiles, governance.
5. Additional considerations – Political, economic, and public concerns.

### **Results & Implications:**

1. A real-time, adaptable threat classification tool.
2. Standardizes risk levels for national health events.
3. Supports evidence-based decision-making and response planning.
4. Enhances coordination across health authorities and emergency systems.

Existing models often focus on travel-related threats or pandemics, neglecting broader risk factors. This model integrates comprehensive public health risks to guide national preparedness and response strategies effectively.

Overall, the threat classification model based on national risk levels provides an organized, insightful snapshot of the threat landscape. It helps leaders and planners swiftly grasp which threats present the most serious challenges, fostering informed decision-making to enhance national resilience and security. Each threat category is addressed in proportion to its risk, thereby optimizing mitigation efforts for better protection of the nation's people, infrastructure, and interests.