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An Epidemic Radar Built from Ordinary Doctor's Notes

How DeepSensi turns the exhaust of everyday medicine into a privacy-preserving early-warning system for the next outbreak

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The most valuable early-warning signal in a pandemic is also the most perishable. In the first days of an outbreak — before the laboratory confirmations, before the case counts, before the name of the pathogen is even known — the disease is already walking into clinics. Doctors are already seeing it, describing it, writing it down. And then, almost everywhere on Earth, that information evaporates into a thousand disconnected records, and the world waits weeks for the laboratories to catch up to what the clinics already saw.

DeepSensi, the verified clinical-intelligence system built by Tomasz Jan Gomola, was not designed to be an epidemiology tool. It was designed to make a single physician safer on a single difficult case. But in a new technical paper, the company describes a capability that falls out of its architecture almost for free — a syndromic-surveillance layer called the Global Emergency Response Network, or **GERN**, that turns the ordinary documentation of medicine into an always-on radar for emerging disease.

The trade-off everyone in public health knows

Outbreak detection has been stuck between bad options. Laboratory-confirmed reporting is authoritative but slow — the pathogen has to be suspected, sampled, cultured or sequenced, and reported up a chain before it shows up in the numbers. The fast alternatives are proxies: search queries, social-media chatter, pharmacy sales. Those can move days earlier, but they are treacherous. The cautionary tale that every data scientist in the field has memorized is Google Flu Trends — a system that tracked influenza from search behavior brilliantly, until it didn't, drifting and overshooting until it was quietly retired. A proxy that correlates with disease one season can decouple from it the next.

GERN attacks the trade-off from an angle the older systems couldn't reach. Its signal doesn't come from what people search for, or even from a hurried chief complaint typed into a triage field. It comes from clinical

documentation that has **already passed DeepSensi's verification pipeline** — a multi-specialist deliberation in which every assertion was checked against verified medical evidence before it was written down. The raw material of the radar isn't a keyword. It's adjudicated clinical reasoning.

Reading the population without reading a person

The obvious objection writes itself: clinical records are the most sensitive data there is. GERN's answer is that it never touches identity at all. Patient identifiers are stripped irreversibly at the moment of documentation — not protected downstream, but simply never present downstream. Nothing is ever surfaced below a floor of at least five similar cases clustered in space and time, so no individual can ever be singled out. Every statistic released to a health authority is mathematically perturbed under a fixed privacy budget, so the presence or absence of any one patient cannot be inferred. And the data never has to leave the country it came from: detection can run locally, so a nation's clinical records stay within its borders even as its outbreaks become visible.

What crosses a boundary is never a record. It is a number — *an unusual cluster of this kind of presentation is forming in this region* — and even that number is checked, twice. Before any signal is escalated, an independent panel of analytic agents has to agree it isn't an artifact of a coding change or a shift in who's seeking care, precisely the false alarms that have historically taught public-health officials to distrust syndromic systems. And a qualified human being always stands between a statistical signal and any alert to a government. GERN compresses the time it takes to *detect*; it never presumes to *declare*.

An honest radar

There is a discipline in the paper that is worth noticing, because it is rare in this field. DeepSensi claims **no outbreak-detection results at all**. It describes the architecture, specifies detection mathematics drawn entirely from decades of peer-reviewed epidemiology — the same aberration-detection and spatial-scan statistics public-health agencies already trust — and then lays out, in the open, exactly how it intends to measure whether the whole thing works: prospectively, pre-registered, against gold-standard confirmed outbreaks, reporting the lead time it actually delivers rather than the lead time it hopes for. It is the same posture the company takes toward its autonomous-research program, where capability is described but findings are claimed only when earned. In a domain littered with big-data hubris, a surveillance company saying *we haven't proven this yet, and here is precisely how we'll try* is a form of credibility in itself.

Why it matters beyond one company

The quiet radicalism of GERN is economic. A conventional surveillance system is something public health must fund, staff, and maintain as a thing apart. GERN is a by-product. The documentation is happening anyway; the radar is what you get when a privacy architecture careful enough to be trusted is pointed at the de-identified residue. That inverts the cost structure of early warning — and it points hardest at exactly the places the current system serves worst: the low- and middle-income regions where laboratory capacity is thin but patients are still seen, still described, still written down. DeepSensi flags that reach as a question it wants to test, not a result it has

proven — but it is the question that matters most, and the company has offered the signal to the global health community as a public good, royalty-free, and asked the World Health Organization to help measure it.

Medicine has always generated this signal. Every outbreak in history announced itself first in a doctor's notes. What has never existed is a way to read those notes at the speed and scale of a population without reading a single patient. That, and not a diagnosis, may turn out to be one of the most consequential things a verified clinical system quietly does.

Technical documentation: WP-007, www.deepsensi.com/papers · Press and auditor access: press@deepsensi.com · DeepSensi PBC is a Public Benefit Corporation; public-benefit access to the GERN early-warning signal is written into its charter.

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