geographical area for a finite period of time responsive to the detection of the one or more health conditions within that geographical area; performing additional testing of individuals within the geographical area within the finite period of time; and allocating additional resources to the geographical area for which the one or more health conditions were detected.

**[0016]** In a further embodiment, a global laboratory network is provided. The network includes a plurality of networked laboratories having a geographical distribution and configured to provide continuous monitoring of populations, targeted testing, and/or scientific functions, wherein each one of the plurality of networked laboratory is configured to communicate with one or more other ones of the plurality of networked laboratories; and a system monitoring subsystem configured to: receive inputs from the plurality of networked laboratories, and send outputs to one or more of the plurality of networked laboratories in real-time, allocate resources among the plurality of networked laboratories based at least in part on the inputs from the or more laboratories.

**[0017]** In a further embodiment, a method of pandemic preparedness is provided. The method includes providing one or more tests to detect a known, unknown, or emerging pathogen; and providing, responsive to detection of an unknown or emerging pathogen, real-time results across a global network of infrastructure, the global network of infrastructure being configured to provide testing for the unknown or emerging pathogen and respond to the unknown or emerging pathogen.

**[0018]** In a further embodiment, a method of tracking a health condition in a population is provided. The method includes providing one or more tests to detect a set of one or more markers relating to the health condition; obtaining results from the one or more tests; and providing the results in real-time across a global network of infrastructure configured to identify and respond to a known, unknown, or emerging risk to health.

**[0018a]** In a further embodiment, a method of allocating resources within a global bio-surveillance and response system is provided. The method includes obtaining, from a plurality of networked laboratories of the system, a plurality of scorecards indicative of laboratory status; determining, according to the plurality of scorecards, that a first laboratory of the plurality of networked laboratories has a resource deficiency of one or more resources; determining, according to the plurality of scorecards, that a second laboratory of the plurality of networked laboratories

has a resource surplus of one or more resources; and routing one or more resources from the second laboratory to the first laboratory.

**[0019]** Further features as well as the structure and operation of various embodiments are described in detail below with reference to the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0020]** The following figures form part of the present specification and are included to further demonstrate certain aspects of the present invention. The invention may be better understood by reference to one or more of these figures in combination with the detailed description of specific embodiments presented herein.

WHAT IS CLAIMED IS:

1. A method of allocating resources within a global bio-surveillance and response system, the method comprising:

receiving information relating to one more available resources of a network of laboratories configured to monitor one or more health conditions in real-time;

analyzing the information based at least in part on one or more selection criteria; and

routing one or more of equipment, test samples, instruments, supplies, and/or personnel to a selected laboratory among the network of laboratories responsive to analyzing the received information and based on the one or more selection criteria.

2. The method of claim 1, wherein the one or more available resources include testing capacity, current inventory, current supplies, and/or a total number of instruments of a networked laboratory.

3. The method of claim 1, wherein the routing step further includes re-routing one or more of equipment, test samples, instruments, supplies, and personnel that have been previously routed based on the one or more selection criteria.

4. The method of claim 1, further comprising scheduling one or more of testing, personnel allocation, and/or sample transportation within laboratories of the network of laboratories.

5. The method of claim 4, wherein scheduling further comprises receiving commands for establishing rules to allocate resources and/or schedule tasks on a global scale via a global scheduler.

6. The method of claim 4, wherein scheduling further comprises receiving commands for establishing rules to allocate resources and/or schedule tasks on a regional scale via a regional scheduler.

7. The method of claim 6, wherein the regional scheduler further includes allocating resources and/or scheduling tasks within one or more farms of instruments.

8. The method of claim 4, further comprising receiving as an input one or more of a type of test results to be processed and/or frequency to be performed by one or more test sites when determining how to allocate resources and/or schedule tasks.

9. The method of claim 4, further comprising receiving as an input one or more of staffing schedules and/or performance metrics of one or more facilities and/or sites when determining how to allocate resources and/or schedule tasks.

10. The method of claim 4, further comprising receiving and managing an allocation of customer orders for equipment, supplies, and/or other resources within the network of laboratories.

11. The method of claim 1, further comprising dispatching one or more of supplies, test samples, equipment, and/or samples within the network of laboratories.

12. The method of claim 11, wherein dispatching further includes procuring and/or distributing inventory and/or equipment between the network of laboratories.

13. The method of claim 1, further comprising load balancing the network of laboratories, via a load balancing module, wherein the load balancing module employs a combination of real-time algorithms and human analysis to optimize resource allocation and/or task scheduling within the network of laboratories.

14. The method of claim 13, wherein the real-time algorithms evaluate one or more of staff levels, supply inventory levels, and/or testing throughput of one or more laboratories and/or other facilities to optimize resource allocation and/or task scheduling within the network of laboratories.

15. The method of claim 13, wherein the load balancer further includes minimizing workloads of operators at one or more testing facilities.

16. The method of claim 13, wherein the load balancer further includes predicting timing for inventory replenishment of one or more laboratories and/or other facilities within the network of laboratories.

17. The method of claim 13, wherein the load balancer further includes optimizing resource allocation and/or task scheduling based on considerations of proximity of resources to laboratories and/or other facilities.

18. The method of claim 13, wherein the real-time algorithm further includes adjusting dynamically based on a change of circumstances, including a site being taken off line and/or a region being made temporarily unavailable.

19. The method of claim 1, wherein monitoring the one or more health conditions includes monitoring for one or more biological, chemical, and biochemical anomalies.

20. The method of claim 19, wherein the monitoring further includes performing luminescence testing.

21. The method of claim 20, wherein the luminescence testing includes chemiluminescence testing.

22. The method of claim 20, wherein the luminescence testing includes electrochemiluminescence testing.

23. A method of minimizing the spread of a health condition in a population, the method comprising:

providing targeted testing to detect one or more health conditions among a population

within a geographical area, wherein the health conditions are at least one of biological, chemical, and biochemical;

confining the population within that geographical area for a finite period of time responsive to the detection of the one or more health conditions within that geographical area;

performing additional testing of individuals within the geographical area within the finite period of time; and

allocating additional resources to the geographical area for which the one or more health conditions were detected.

24. The method of claim 23, wherein the additional resources include one or more of equipment, instruments, supplies, and/or personnel.

25. The method of claim 23, further comprising performing contact tracing to minimize the spread of the one or more health conditions.

26. The method of claim 23, further comprising performing predictive and/or artificial intelligence/machine-based learning to predict locations and/or groups of individuals more likely to test positive for the one or more health conditions.

27. The method of claim 23, further comprising performing recursive testing and/or real-time data analysis of infected and/or potentially affected individuals.

28. The method of claim 23, wherein performing additional testing further includes one or more of:

increasing a rate of testing among the population to detect the presence of the one or more anomalies, and

increasing a number of individuals tested among the population to detect the presence of the one or more anomalies.

29. The method of claim 23, wherein the targeted testing is performed by a plurality of cartridge reader testing devices distributed among a geographical area.

30. The method of claim 23, wherein the targeted testing is performed by a plurality of Point of Care (POC) devices distributed among the geographical area.

31. The method of claim 23, further comprising performing predictive testing on one or more of face masks, test equipment, and/or environmental surfaces to determine the presence of one or more pathogens.

32. The method of claim 23, wherein results from the targeted testing and the additional testing are reported in real-time over a web-based platform.

33. The method of claim 32, wherein the web-based platform is a cloud-based platform.

34. The method of claim 23, wherein the providing targeted testing of one or more health conditions includes performing luminescence testing.

35. The method of claim 34, wherein the luminescence testing information includes chemiluminescence testing.

36. The method of claim 34, wherein the luminescence testing includes electrochemiluminescence testing.

37. A method of allocating resources within a global bio-surveillance and response system, the method comprising:

obtaining, from a plurality of networked laboratories of the system, a plurality of scorecards indicative of laboratory status;

determining, according to the plurality of scorecards, that a first laboratory of the plurality of networked laboratories has a resource deficiency of one or more resources;

determining, according to the plurality of scorecards, that a second laboratory of the plurality of networked laboratories has a resource surplus of one or more resources; and

routing one or more resources from the second laboratory to the first laboratory.

38. The method of claim 37, wherein the one or more resources include one or more of equipment, test samples, instruments, supplies, consumables and personnel.

39. The method of claim 37, further comprising:

engaging an external shipping service to perform the routing.

40. The method of claim 37, further comprising routing one or more resources from a manufacturing facility to the first laboratory.

41. The method of claim 37, wherein determining that a first laboratory has a resource deficiency is further performed according to an amount of samples scheduled for processing at the first laboratory.

42. The method of claim 41, wherein determining that a first laboratory has a resource deficiency includes determining a future resource deficiency based on the amount of samples scheduled for processing at the first laboratory.