Table 1: A COVID-19 control package using a Systems Thinking Biomatrix Tool and administrative actions

<table>
<thead>
<tr>
<th>Biomatrix Item</th>
<th>Description</th>
<th>Component or Action</th>
<th>Examples</th>
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</thead>
<tbody>
<tr>
<td>• <strong>Aims</strong> (Vision)</td>
<td>The Outcome(s): the results that the system wants to achieve. Aims create focus.</td>
<td>A nation without Coronavirus! (Positive public Communication)</td>
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<tr>
<td>• <strong>Ethos</strong></td>
<td>Organizational Culture: its unique expectations, and values and is expressed in its self-image: “As you think, so you will become”.</td>
<td>We always win! (Positive public Communication)</td>
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<tr>
<td>• <strong>Structure</strong></td>
<td>The Organogram: the anatomy of a system.</td>
<td><strong>Strategic Multidisciplinary</strong>, Intergovernmental body with its comprehensive administrative and executive components. <strong>Strategic Roadmap</strong> for the Health-care sector and the population as a whole. <strong>Monitoring and Assessment</strong> unit with timely data capture, analysis and action supported by efficient information technology platforms.</td>
<td>Multidisciplinary Team from all ministries, nongovernmental organizations, social support societies, charitable organizations, professional unions, international agencies etc.</td>
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<tr>
<td><strong>Process</strong></td>
<td><strong>The Activities:</strong> describes the activities of the system: the activities involved in the delivery of services (training) to the customers.</td>
<td><strong>Health care directed:</strong></td>
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</table>
|  |  | • Facility preparedness  
• Staff education and training  
• Confirmed and suspected patients’ clinical management pathways  
• Staff support and incentives, etc.  
• Patient and family education  |
|  |  | • Efficient screening of staff and patients  
• Effective diagnostic capabilities  
• Reducing in-hospital transmission (personal protective equipment (PPEs), handwashing, triaging, cohorting of patients and of staff, disposal of hazardous material, environmental cleanliness and hygiene, restricting non-urgent clinical services, virtual outpatient and inpatient patient encounters, etc.)  
• Screening of visitors and restricting hospitalized patients visits by relatives, friends, etc.  |

| **Population Directed:**  
Education and empowerment,  
Personal hygiene practices e.g. hand washing, sneezing and coughing etiquette etc., Social Distancing, Wearing masks, Restriction of social  | **Quarantine and isolation centers**  
• Robust contact tracing, isolation and close monitoring during isolation etc.  |
| • Resources | Material and Intellectual Assets: refer to the resources of the organization, such as its capital equipment, financial resources, intellectual property, staff capabilities etc. | • System Leadership  
• Diagnostic and treatment facilities  
• Internists  
• Infection Control Specialists  
• Patient Educators  
• Epidemiologists  
• Infectious Diseases Specialists  
• Intensivists  
• Trainers and Educationalists  
• Statisticians  
• Financial Resources  
• Monitoring teams/IT Specialists  
• Social Psychologists  
• Audiovisual Resources  
• Covid-19 cyberspace resources, Website, Blogs in simple language etc.  
• Local Social and Religious support teams |
| --- | --- | --- |
| • Environment | Local & Surrounding Facilitators & Barriers: (the latter need to be | • Social activists and local support networks in the community.  
• Incentive Program for all healthcare workers. |
| • Governance | Regulation & Monitoring: The function of governance in an organization is to set aims and to monitor and regulate the movement of the organization towards the attainment of these aims. | • Insurance and financial support to healthcare workers who get infected.  
• Collaboration with Research Centers, Technology and Innovation Centers, Evidence-based Practice Centers, Quality Improvement Organizations, International bodies etc.  
• Daily reporting from the monitoring unit and assessment of progress, successes and failures and timely interventions to improve performance and deal with unintended consequences. |