ECONOMIC ADVISORY TASK FORCE
COVID-19 Pandemic Emergency in Puerto Rico

Informe Comisión Especial Asesora de Asuntos Económicos
Proceso de Reapertura de la Economía
24 de abril de 2020

Resumen Ejecutivo

Trasfondo

El pasado 12 de marzo de 2020 la Gobernadora de Puerto Rico, Honorable Wanda Vázquez Garced, emitió la Orden Ejecutiva OE-2020-020, declarando un estado de emergencia ante el inminente impacto de una nueva cepa del Coronavirus en la Isla. Posteriormente, bajo la Orden Ejecutiva OE 2020-023 se viabilizan los cierres necesarios del sector gubernamental y del sector privado para controlar los efectos del COVID-19 en la Isla. Entendemos que las medidas establecidas han sido efectivas en reducir el nivel de transmisión y la velocidad del contagio. Al presente las pérdidas de vidas, aunque muy lamentables todas, se han mantenido por debajo de las proporciones proyectadas por el Departamento de Salud a principios del mes de marzo.

En Puerto Rico, como a nivel global, las restricciones establecidas por las órdenes ejecutivas han limitado la actividad económica. Asimismo, estimamos que las mismas han tenido un impacto de $5,800 millones en nuestra economía.

La economía de Puerto Rico experimenta una depresión desde el año 2006. En los últimos tres años, Puerto Rico ha sido impactado por varios desastres incluyendo el huracán Irma (septiembre de 2017); el huracán María (septiembre de 2017); la secuencia sísmica que comenzó el pasado 28 de diciembre de 2019 que no ha concluido; y ahora la Pandemia causada por el COVID-19 este siendo el cuarto desastre mayor en azotarnos.

Gráfico 2. Curva epidémica basado en pruebas moleculares (n=849)

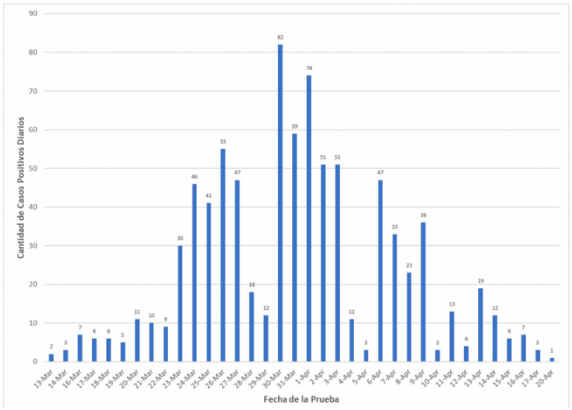
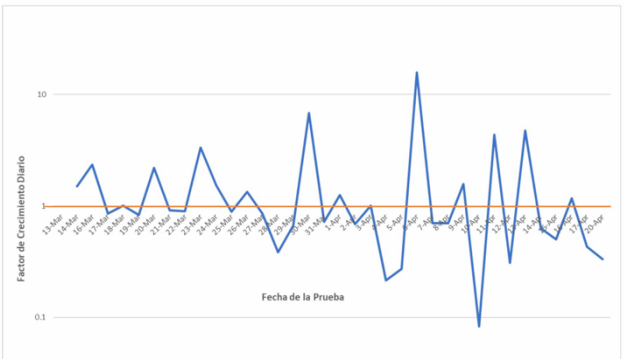


Gráfico 3. Factor de Crecimiento Diario, basado en la fecha de la prueba molecular (n=849)



Desde el pasado 23 de marzo, el Comité Asesor Económico ha estado trabajando en el desarrollo de un modelo para hacer recomendaciones en cuanto a la reapertura económica en fases. La perspectiva económica del modelo está basada en el impacto de los diferentes sectores que aportan a la economía en términos del Producto Interno Bruto ("GDP" por sus siglas en inglés), el nivel de empleo asociado a cada sector y el índice relativo de riesgo de activación de cada sector. También se tomó en consideración el manejo de COVID en PR en cuanto a sostener la capacidad del sistema de salud utilizando como parámetros la disponibilidad de unidades de intensivo y de ventiladores.

A la fecha del 21 de abril, según reportado por el Departamento de Salud, de la capacidad total disponible en los hospitales de Puerto Rico solo 2% de los hospitalizados estaban asociados a COVID 19. Asimismo, se mantenía un 50% de la capacidad de camas de intensivo y 79% de la capacidad de ventiladores disponibles. Basado en la capacidad disponible, y en los resultados de una encuesta llevada a cabo por este Comité Asesor que refleja un 0.0393% de los empleados activos positivos a COVID-19, presentamos nuestras recomendaciones de reapertura de los sectores que bajo los modelos que hemos utilizado tienen mayor impacto económico y el menor riesgo salubrista.

A la fecha de este informe, los siguientes sectores han sido autorizados para operar como servicios esenciales:

1. Alimentos
   a. Venta de alimentos preparados, EXCLUSIVAMENTE mediante el modelo servicarro o entrega (carry-out o delivery), sin permitir comensales en el interior de los establecimientos;
   b. Venta de alimentos al detal o al por mayor;
   c. Negocios que estén relacionados a las cadenas de distribución de alimentos (incluye agricultores y empleados de la industria agropecuaria) y bebidas, incluyendo alimentos para animales, procesadoras y elaboradoras de alimentos y bebidas y negocios dedicados a la distribución de alimentos y bebidas, fincas hidropónicas y actividad agropecuaria en general;

d. Supermercados y colmados, incluyendo negocios cuyos componentes incluyan supermercados o colmados. Podrán permanecer abiertos al público de lunes a sábado de 5:00 a.m. hasta las 8:00 p.m., y aquellos que cuenten con sistema de entrega (delivery), podrán despachar órdenes hasta las 10:00 p.m. No obstante, los supermercados y colmados deberán permanecer cerrados al público los domingos, limitando sus operaciones a la limpieza, desinfección, inventario, recibo y manejo de mercancía; e. Puntos de venta al detal como quioscos de alimentos frescos (frutas, verduras y vegetales) establecidos previo al 15 de marzo de 2020.

2. Salud, medicamentos, artículos o equipo médico y farmacias
   a. Incluye negocios que se dediquen a la producción, venta, o provisión de servicios relacionados a medicamentos, artículos o equipo médico, o provisión de servicios de cuidado médico, y aquellos que estén en su cadena de distribución, incluyendo:
      i. Operaciones de manufactura y venta de productos farmacéuticos;
      ii. Operaciones de manufactura y venta de dispositivos médicos;
      iii. Biotecnología e instalaciones de biotecnología agrícola (manufactura y venta);
      iv. Operaciones de manufactura y venta de suministros para los hospitales y otras instituciones y proveedores de salud;
      v. Manufactura y venta de productos de limpieza, desinfectantes y equipo de protección personal necesario para atender la crisis del COVID-19;
      vi. Hospitales;
      vii. Laboratorios clínicos;
      viii. Salas de emergencia;
      ix. Clínicas de servicios médicos;
      x. Farmacias;
      xi. Dispensarios de cannabis medicinal;
      xii. Instalaciones de cultivo y procesamiento de cannabis medicinal;
      xiii. Centros de salud;
      xiv. Bancos de sangre;
      xv. Farmacias; no obstante, los domingos sólo podrán operar el área del recetario, vender medicamentos y artículos de higiene personal;
      xvi. Centros de cuido de ancianos;
      xvii. Compañías o aseguradoras que provean cubiertas de planes médicos;
      xviii. Oficinas de facultativos médicos, solo en caso de emergencia y mediante cita previa, prestando especial atención y tomar medidas pertinentes en el caso de mujeres embarazadas. Los procedimientos médicos electivos deberán estar suspendidos;
      xix. Oficina de tratamientos especializados, incluyendo, entre otros, centros de diálisis y de tratamiento de cáncer, y otras enfermedades graves o catastróficas;
      xx. Oficinas dentales, solo en caso de emergencia y mediante cita previa; xxi. Clínicas veterinarias, mediante cita previa.
3. Gasolineras y su cadena de distribución a. Combustibles (procesamiento, venta y distribución); b. Refinado: gasolina, diesel, jetfuel, AV-Gas, gas propano, gas butano, gas natural, gas licuado, queroseno, entre otros; c. Mezclado (intermediate fuels, blended); d. Producción, distribución, venta al por mayor, venta al detal (gasolineras). De lunes a sábado, las gasolineras podrán operar normalmente dentro de las condiciones del toque de queda. No obstante, los domingos las gasolineras solo podrán operar para despachar combustible o medicamentos.
4. Instituciones financieras
   a. Instituciones depositarias que ofrezcan servicios bancarios como bancos y cooperativas para servicios que puedan ser coordinados o procesados en línea, electrónicamente, llamadas telefónicas o mediante uso del automóvil;
   b. Entidades prestamistas;
   c. Casas de empeño, solo en cuanto al recibo de bienes a manera de empeño mediante contrato de prenda y para el pago de deudas (no estará permitida la venta de bienes y/o mercancía).
5. Organizaciones o grupos que provean servicios para atender necesidades básicas para poblaciones económicamente desfavorecidas
   a. Refugios para personas sin hogar;
   b. Bancos de alimentos;
   c. Refugios para víctimas;
   d. Albergues;
   e. Residencias temporeras.
6. Seguridad
   a. Agencias y compañías de seguridad privadas;
   b. Asistencia en la carretera, en la medida en que sea solicitado por el suscriptor del servicio o por un agente del orden público.
7. Seguridad Nacional
   a. Operaciones de manufactura, venta o servicios relacionados a la Industria Aeroespacial;
   b. Operaciones de manufactura, venta o servicios relacionados a cualquier agencia federal, incluyendo al Departamento de la Defensa de los Estados Unidos;

c. Industria de textiles, conforme a lo dispuesto en la Carta Circular Núm. 202004 del DDEC, emitida el 1 de abril de 2020.

8. Infraestructura crítica
   a. Infraestructura relacionada a la Autoridad de Energía Eléctrica, la Autoridad de Acueductos y Alcantarillados, telecomunicaciones, sistema vial, desperdicios sólidos y biomédicos, puertos marítimos, aeropuertos;
   b. Reparación, reemplazo, mantenimiento y rehabilitación de infraestructura crítica y equipos para tener acceso a dicha infraestructura, incluyendo, en el caso de infraestructura de telecomunicaciones, teléfonos celulares, tabletas, cajas de cable TV, y otros equipos similares y necesarios para que los consumidores puedan utilizar dicha infraestructura crítica, mediante cita previa coordinada por teléfono o cualquier medio electrónico, para lo cual se permitirá a cada compañía establecer puntos estratégicos por regiones, en coordinación con el Negociado de Telecomunicaciones de Puerto Rico, para ofrecer servicios de reparación, entrega, sustitución de equipos y tecnología necesaria para mantener la comunicación vía telefonía fija, celular, internet, cable TV o antenas, limitado a clientes existentes;
   c. Reparación y mantenimiento de calles, carreteras y autopistas. d. Reparación y manteamiento de infraestructura privada para asegurar la continuidad de las operaciones y servicios autorizados por la OE-2020-033.

9. Bienes y servicios
   a. Cuido de envejecientes;
   b. Centros de llamadas (call centers);
   c. Compañías de seguridad pública, privada, estatal y federal;
   d. Servicios relacionados a cualquier agencia federal, incluyendo, sin limitación, el Departamento de la Defensa de los Estados Unidos;
   e. Servicios de asistencia a la carretera, solamente en caso de emergencia;
   f. Servicios de cerrajería, solamente en caso de emergencia;
   g. Compañías de entrega y envío de paquetes, mercancía y correspondencia;
   h. Servicios de circuito cerrado y alarmas;
   i. Servicios a puertos y aeropuertos;
   j. Servicios de procesamiento de transacciones electrónicas;
   k. Operaciones de centros de datos (data centers) sensitivos;
   l. Prensa y medios de comunicación;
   m. Agencias de viaje operando con centro de llamada (call centers);
   n. Servicios de reciclaje;
   o. Servicios de plomería, electricista, técnicos de refrigeración, reparación, mantenimiento o reemplazo de enseres eléctricos domésticos, exterminación y control de plagas, limpieza de piscinas, empresas y empleados independientes que se dediquen al mantenimiento de áreas verdes, jardinería, landscaping o paisajismo, mantenimiento y reparación de elevadores, mantenimiento y reparación de controles de acceso, y otros servicios necesarios para el mantenimiento de la salud, la seguridad y operación esencial a nivel individual, residencial, comercial, industrial o público. Al realizar su labor, el proveedor de servicios deberá tener cubierta su boca con una mascarilla y guantes. Cualquier establecimiento cuyo fin sea recibir público, deberá permanecer cerrado;
   p. Recogido de basura (privado o público);
   q. Agricultura ornamental;
   r. Servicios fúnebres relacionados al recogido o traslado de cadáveres, embalsamamientos, cremaciones y entierros (no velatorios), así como servicios de construcción e instalación de nichos en los cementerios, entrega de unidades y mantenimiento y limpieza en las instalaciones;
   s. Manufactura de bienes no esenciales para propósitos de exportación, así como exportación de bienes no esenciales que forman parte del inventario actual;
   t. Aquellas compañías y personas que ofrezcan servicios de reparación y piezas de vehículos, incluyendo técnicos automotrices, gomeros y distribuidores de piezas, podrán operar solo en casos de emergencia los miércoles y jueves entre 9:00 a.m. y 5:00p.m., mediante cita previa, atendiendo un (1) solo cliente a la vez. No podrá abrir para el público en general. Se autoriza el suplido de inventario para este sector;
   u. Servicios de ferreterías, podrán operar los viernes y sábados entre 9:00 a.m. y 5:00 p.m., solamente mediante cita previa para coordinar la venta y entrega de la mercancía, atendiendo un (1) solo cliente a la vez. No podrá abrir para el público en general. Se autoriza el suplido de inventario para este sector. No obstante, de lunes a jueves se autoriza a las ferreterías a despachar órdenes recibidas por teléfono o cualquier método electrónico de comunicación, realizada ante una emergencia por una entidad gubernamental, o de un comercio o proveer de servicio exento del cierre de operaciones conforme a la OE-2020033;
   v. Ventas por teléfono o internet (online), para lo cual se permitirá operar almacenes únicamente para despachar órdenes a modo de recogido y entrega en el vehículo (curbside pickup) o envío (delivery);

w. Empresas que vendan equipo electrónico o materiales de oficina, únicamente mediante cita previa y a modo de recogido y entrega en el vehículo (curbside pickup) o envío (delivery);

10. Construcción a. Se autoriza al sector de la construcción a operar siempre y cuando sea para ofrecer servicios críticos, de mantenimiento o de reparación, o de nueva construcción, relacionados a hospitales, agua potable, aguas servidas, transportación, sistema vial, electricidad y comunicaciones, sujeto a la implantación de estrictas medidas de seguridad para proteger la salud y seguridad de los trabajadores contra el COVID-19 y fundamentados en las Guías del Centers for Disease Control and Prevention (CDC), el Departamento de Salud federal, el Occupational Safety and Health Administration y el Departamento del Trabajo federal; b. Se autoriza además al sector de la construcción a operar para la construcción de instalaciones de manufactura u de otra índole relacionadas al manejo, prevención, tratamiento o estudios relacionados al COVID-19, sujeto a la implantación de estrictas medidas de seguridad para proteger la salud y seguridad de los trabajadores contra el COVID-19 y fundamentados en las Guías del Centers for Disease Control and Prevention (CDC), el Departamento de Salud federal, el Occupational Safety and Health Administration y el Departamento del Trabajo federal; c. Se autoriza, además, el suplido de materiales para el sector de la construcción según autorizado en la OE-2020-033, incluyendo la distribución de cemento y productos relacionados.

11. Cadenas de suministros relacionados a bienes y servicios exentos conforme a los incisos anteriores a. Empresas que provean bienes o servicios a los sectores exentos del cierre, limitando sus operaciones a suplir dichos bienes o servicios; b. Suplido de artículos para los sectores exentos del cierre; c. Distribución de artículos para los sectores exentos del cierre; d. Logística y transporte: los corredores de aduana, el servicio de consolidación de carga marítima o terrestre, servicios de almacenaje y distribución a terceros y la distribución de detergentes, desinfectantes y productos de higiene y limpieza; e. Servicios de diseño, venta e instalación de prevención de incendios; f. Servicios de armería para el sector de seguridad (policías, agencias de seguridad y seguridad federal); g. Agencias de empleo operando como centro de llamadas (call centers); h. Reparación y mantenimiento de sistemas de producción de energía basados en energía renovable o alterna. Las actividades exentas del cierre de operaciones continuarán su operación bajo su horario regular, incluyendo aquellas que operan 24/7. Conforme a la Sección 1ra de la OE-2020-033, según enmendada por la OE-2020-034, aquellos comercios autorizados a operar hasta las 8:00 p.m., solo podrán recibir público en general hasta las 7:00p.m., mientras que entre 7:00 p.m. y 8:00 p.m., solo podrán recibir y atender personas que trabajen en hospitales, laboratorios tecnológicos y agentes del orden público que así se puedan identificar. Se aclara, además, que aquellas industrias, comercios y empresas exentos del cierre de operaciones conforme a la OE-2020-033 y esta Carta Circular podrán continuar operando en su horario regular, independientemente de las enmiendas introducidas por la OE-2020-034 a la Sección 1ra de la OE-2020-033.

Sobre la Comisión Asesora Especial de Asuntos Económicos

La Comisión está compuesta por líderes del Sector Privado, representación del Sector Sindical, miembros del Equipo Económico de la Gobernadora y representación de la Junta de Supervisión Fiscal de Puerto Rico. Con el fin de llevar a cabo los trabajos de la Comisión, se utiliza la gobernanza del PR Business Emergency Operation Center (PR-BEOC). La representación por parte del Sector Privado la componen miembros de la Junta del PR-BEOC y miembros nombrados por el Gobierno. Los portavoces de la Comisión son el Secretario del Departamento de Desarrollo Económico y Comercio por el Sector Público y el Presidente de la Junta del PR-BEOC por el Sector Privado.

La Comisión ha dividido sus trabajos en tres grupos o *workstreams* para atender los asuntos relacionados con las recomendaciones a presentarse al Gobierno. Los trabajos se complementan con colaboradores que participan de los distintos grupos de trabajo y en representación de los distintos sectores económicos de Puerto Rico. Los trabajos de los tres *workstreams* se describen a continuación:

Workstream 1 – Recomendaciones dirigidas a atender asuntos inmediatos relacionados con la emergencia.

Workstream 2 – Recomendaciones dirigidas a la reapertura de la economía y transición de la emergencia a la fase de recuperación.

Workstream 3 – Recomendaciones dirigidas a atender la recuperación económica de Puerto Rico a mediano y largo plazo.

Las recomendaciones son desarrolladas por los distintos *workstreams*. Una vez los *workstreams* las aprueban se presentan al pleno de la Comisión para discusión, adopción y remisión al Gobierno. Los representantes del Sector Público (Gobierno y Junta de Supervisión Fiscal) tienen voz, pero no tienen voto.

La Comisión cuenta con cuatro economistas. Estos se encargan de hacer el análisis y validación de impactos económicos de las distintas recomendaciones que los grupos de trabajo preparan.

Modelo de Transición

Entendiendo la necesidad de balancear las necesidades de salud con las económicas de nuestro pueblo, el Grupo de Trabajo (*Workstream*) Número 2 ha desarrollado una propuesta para la reapertura paulatina de nuestra economía. Estas recomendaciones buscan que se establezcan sistemas de manejo de riesgos de contagios en el lugar del trabajo y sistemas de monitoreo de sus posibles efectos en los contagios. Debido a la fragilidad de la infraestructura de salud del archipiélago puertorriqueño, el modelo de regreso al trabajo tiene que estar basado en evitar abrumar los recursos disponibles en los hospitales para manejar pacientes de COVID-19. Durante el desarrollo del modelo, no fue posible obtener datos con relación a la razón de contagios en la población. La manera en que las autoridades de salud informaban los contagios sin estar relacionados con la fecha de toma de la muestra, ni la posibilidad de replicar un modelo epidemiológico, nos llevó a buscar otros datos para poder entender el comportamiento de esta pandemia incluyendo datos sobre múltiples periodos de incubación pasados. En nuestro modelo es fundamental poder establecer un monitoreo de infraestructura disponible en hospitales. Para ello, el dato principal utilizado es el número de respiradores disponibles.

Cada fase del plan tendrá una duración de un periodo de incubación equivalente a 14 días. Se recomienda pasar a fases subsiguientes mientras un aumento en contagios no exceda el uso del 25% de los respiradores disponibles. Si durante el periodo en cuestión el aumento en uso de respiradores es mayor a 25%, no se recomienda pasar a la etapa subsiguiente. Si el aumento llegara a 50% se recomienda llevar a cabo un proceso de regresión a la etapa anterior, ya que pudiera comprometer el sistema y la capacidad de tratar pacientes y salvar vidas.

Con el objetivo de evaluar los sectores a ser incluidos en cada fase, se tomaron en consideración tres factores. Estos son:

1. Índice de Riesgo de Contagio preparado por la Escuela de Salud Pública del Recinto de Ciencias Médicas de la Universidad de Puerto Rico.
2. Número de Empleados en cada sector.
3. Participación en el Producto Interno Bruto.

Fase I

Se recomienda que en la primera fase de regreso al trabajo se autorice a reanudar labores a las siguientes industrias, además de las exentas a la fecha de hoy:

1. Manufactura que no haya estado exenta del *lockdown*.

   Este es el sector que mayor participación tiene en el Producto Interno Bruto y mayor índice económico de acuerdo al modelo desarrollado por esta Comisión. Además, es una industria altamente reglamentada donde el tomar las medidas de distanciamiento social necesarias para minimizar el riesgo de contagio por COVID-19 son comunes.

2. Construcción

   De acuerdo con el índice relativo de riesgo de infección y letalidad por COVID-19, este es el sector con menor riesgo a contagios. Es una industria altamente reglamentada y donde las medidas de distanciamiento social necesarias son comunes. Además, el sector tiene la capacidad de creación rápida de empleos y actividad económica concurrentemente. Además, existe la necesidad de continuar con los programas de recuperación de desastres en el umbral de una temporada ciclónica activa pronosticada para este año y una actividad sísmica que continúa en el área Suroeste de Puerto Rico desde el pasado mes de diciembre de 2020.

3. Hospitales para cirugías electivas y demás actividades no relacionadas con la Emergencia.

   Aunque el índice relativo de riesgo de contagio por COVID-19 es alto, la condición de estas facilidades es que experimentan un nivel de ocupación bajo de pacientes. Las medidas extremas tomadas por el Gobierno de Puerto Rico lograron no abrumar la capacidad de nuestros hospitales para tratar pacientes de COVID-19. Asimismo, se reporta que hay sólo aproximadamente 300 pacientes hospitalizados por esta enfermedad. El nivel de subutilización de las facilidades de salud es tal que amenaza seriamente su viabilidad financiera a corto plazo. Debido a la importancia que representa este sector ante la pandemia es crítico poder flexibilizar su operación de manera que los hospitales puedan diversificar sus ingresos. Esto lo podrían hacer manejando el riesgo de contagios adicionales por COVID-19 que pueda comprometer equipos en inventario para precisamente tratar esta enfermedad. Cada facilidad deberá incorporar en sus planes de manejo de riesgo por contagio de COVID-19 aquellas guías que el Task Force Médico adopte para esta flexibilización.

Se recomienda mantener las medidas de distanciamiento social seguro como están siendo implantadas, así como ampliar la adopción de otras medidas que se detallan más adelante. Además, se recomienda que el toque de queda se mantenga, pero modificando el mismo de 9:00pm a 5:00am. Fases subsiguientes serán sugeridas en los próximos días.

Es preciso mencionar que para asegurar la continuidad de las operaciones en los sectores a flexibilizarse es necesario autorizar la operación de los negocios incluidos en la cadena de insumo de bienes y servicios de cada uno. Estos incluyen:

1. Manufactura:
    a. Laboratorios, servicios profesionales, venta de equipos y materiales

2. Construcción:
    a. Ferreterías y establecimientos análogos, venta de materiales, manufactura y distribución de cemento, canteras, centros de servicio y venta de vehículos y equipos pesados, laboratorios de materiales, servicios de ingeniería, servicios de arquitectura, servicios de agrimensura, estudios de título, tasadores, notaría, pólizas de título, seguros, fianzas ("surety"), cdorredores de bienes raíces, entre otros.

3. Hospitales y Sector de Salud:
    a. Laboratorios clínicos, venta de equipo y materiales protectores, entre otros.

Los proveedores de insumos a estas industrias se recomiendan abran al menos cinco días por semana. Esto con el fin de garantizar la cadena de suministros a estos sectores.

Planes de Manejo de Riesgo de Contagios en el Lugar del Trabajo

Se recomienda que cada patrono de un sector autorizado a regresar al trabajo por la Gobernadora prepare un plan de manejo de riesgo de contagio basado en la guía de la Administración de Salud y Seguridad Ocupacional OSHA 3990, publicado el pasado mes de marzo, y adoptado por la Oficina de Salud y Seguridad Ocupacional de Puerto Rico ("PROSHA" por sus siglas en inglés) del Departamento de Trabajo y Recursos Humanos (DTRH) y el Centro para el Control de Enfermedades Federal ("CDC" por sus siglas en inglés). Se recomienda que antes de comenzar operaciones, el patrono prepare un documento de auto-certificación de cumplimiento con las normativas aplicables y un plan. Esta auto-certificación se recomienda que sea sometida al DTRH siete (7) días antes de comenzar operaciones. Sugerimos que la auto-certificación se considere aceptada al cabo de siete días laborales y que la evidencia de su remisión al DTRH sea suficiente para el comienzo de operaciones.

Se recomienda que todo patrono implante por lo menos las siguientes medidas de control:

1. Medidas de distanciamiento social.
2. Uso de equipo de protección personal.
3. Verificación de temperatura.
4. Protocolos de sanidad.
5. Protocolos de desinfección de áreas de alto tráfico de personas.

El PR-BEOC desarrolló una herramienta para asistir a los patronos en la preparación de los planes de manejo de riesgo de contagio en el lugar de trabajo, copia de la cual se acompaña a esta comunicación. No se recomienda que esta herramienta sea de carácter mandatorio. Tampoco se recomienda que se haga de carácter mandatorio la implantación de todas las estrategias de mitigación descritas toda vez que la intención de la herramienta es que cada patrono evalúe e implante las estrategias que mejor se adapten a su operación tomando en consideración las diferentes guías que le sean aplicables.

Condiciones Concurrentes

Entendemos que existen unas acciones que son necesarias para maximizar las oportunidades de éxito del plan de manejo que cada patrono implante. Es importante que el Gobierno de Puerto Rico implante de forma concurrente las siguientes acciones además de autorizar las aperturas aquí sugeridas:

1. Aumentar la capacidad instalada para la realización de pruebas moleculares y serológicas.
2. Aumentar el volumen de pruebas moleculares a nivel de toda la Isla.
3. Establecer un sistema de rastreo de contactos.
4. Procurar que trabajadores de respuesta inicial tengan equipos de protección personal.
5. Mantener equipos de protección personal adecuado en los hospitales de Puerto Rico para así proteger la capacidad de manejo del Sistema de Salud.
6. Mantener, publicar y monitorear diariamente la información sobre contagios en los subsectores activos, así como de los nuevos según vayan integrándose subsectores, y el número de empleados activos en cada subsector activo.
7. Publicar todos los datos de manera abierta y transparente.

Por favor note que se acompaña a esta comunicación copia de los siguientes documentos:

1. Informe económico preparado por el Grupo de Trabajo Número 2.
2. Guías para el Regreso al Trabajo adoptadas por la Comisión Especial Asesora de Asuntos Económicos.

Agradecemos la oportunidad que nos brinda para presentar estas recomendaciones al Gobierno de Puerto Rico. Estamos en la mejor disposición de contestar cualquier duda o pregunta que pueda tener a su conveniencia.

Este Resumen Ejecutivo ha sido preparado por:

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Propuesta Fase 1: Recomendaciones re: Activación y Ampliación de Sectores

Economic Advisory Taskforce Workstream #2

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Preámbulo

La reactivación de la economía de Puerto Rico se tiene que realizar en fases y de una manera segura sin sobrecargar la capacidad del sector médico de Puerto Rico para manejar la pandemia Covid-19. El objetivo principal del "Economic Advisory Taskforce Workstream #2" es servir de puente facilitador para movernos de la emergencia a la recuperación gradual en los ámbitos sociales y económicos. El objetivo primordial es mitigar la propagación de Covid-19 en Puerto Rico y que la velocidad de transmisión de la infección no incremente a niveles exponenciales.

La transición a la recuperación económica se logra cuando los negocios comiencen a operar sin que se aumente la velocidad de transmisión de casos positivos de Covid-19 y los mismos no estén creciendo a una velocidad inmanejable, y se asegure por medio de las guías y el reentrenamiento de los empleados en el negocio, el distanciamiento físico seguro, uso de máscaras/guantes, higiene personal después de cada interacción, minimizando puntos de contacto, y reconociendo los síntomas para reportarlos y comenzar aislamiento inmediato. Se recomienda que todos los negocios/sectores/subsectores que vayan a reabrir o incrementar operaciones mitiguen el contagio y protejan la salud y seguridad de los trabajadores y visitantes contra el COVID-19 y que se fundamenten en las Guías del Centers for Disease Control and Prevention (CDC), el Departamento de Salud federal, el Occupational Safety and Health Administration (OSHA 39-90) y el Departamento del Trabajo federal, se requerirá entrenamiento y supervisión continua a los trabajadores sobre las nuevas medidas de seguridad y las guías de trabajo. Aunque se está recomendando la apertura y ampliación de sectores se recomienda que todo negocio que pueda limitar el tener empleados y visitantes presencialmente lo haga mediante métodos remotos mientras dure la situación de emergencia. Debemos proteger por aguantar el contagio hasta que encontremos un tratamiento efectivo para el Covid-19 y/o suficientes personas se hayan convertido inmunes por medio de una vacuna o por haber tenido ya el virus.

La estrategia de "lockdown" que se efectuó a tiempo por el gobierno de Puerto Rico y las nuevas guías que se han implementado han funcionado en proteger vidas y mantener nuestro sistema de salud con un nivel de casos manejables y ahora nos toca sopesar de una manera responsable y ordenada la reactivación de más sectores económicos para a su vez brindarle opciones a los individuos, familias y compañías que necesitan sustento y un respiro. Para que la apertura en fases sea exitosa todos tenemos que poner de nuestra parte y le requerimos al gobierno que cumpla con las siguientes condiciones: i) aumentar la capacidad de pruebas y realizar las mismas, ii) establecer un sistema de rastreo de contacto, iii) garantizar que los "first responders" tengan todo el equipo de protección ("PPE") necesario, iv) se mantenga y se publique información sobre contagios sobre el publico y los subsectores económicos que estén activos, v) se publiquen todos los datos de manera abierta y transparente.

Todos los puertorriqueños tenemos una responsabilidad indelegable de mitigar el contagio, y es la de cambiar nuestros hábitos sociales, comunicar claramente como hacerlo, y ser transparentes en todo momento, mientras nunca olvidando que no solo lo hacemos por nuestro bien sino por el bienestar de nuestros compañeros, familiares, y seres queridos.

En adelante las recomendaciones del Economic Advisory Taskforce referente a los sectores y subsectores que se deben incluir y ampliar en la próxima orden ejecutiva para dar paso a la fase uno:

Construcción

a. Se autoriza al sector de la construcción a operar, sujeto a la implantación de medidas de seguridad para mitigar el contagio y proteger la salud y seguridad de los trabajadores contra el COVID-19 y fundamentados en las Guías del Centers for Disease Control and Prevention (CDC), el Departamento de Salud federal, el Occupational Safety and Health Administration y el Departamento del Trabajo federal, se requerirá entrenamiento y supervisión continua a los trabajadores sobre las nuevas medidas de seguridad y las guías de trabajo;

b. Se autoriza, además, el suplido de materiales para el sector de la construcción, incluyendo la distribución de cemento y productos relacionados.

Manufactura

Se autoriza al sector de la manufactura a operar, sujeto a la implantación de medidas de seguridad para mitigar el contagio y proteger la salud y seguridad de los trabajadores contra el COVID-19 y fundamentados en las Guías del Centers for Disease Control and Prevention (CDC), el Departamento de Salud federal, el Occupational Safety and Health Administration y el Departamento del Trabajo federal, se requerirá entrenamiento y supervisión continua a los trabajadores sobre las nuevas medidas de seguridad y las guías de trabajo. Se autoriza el suplido de materiales e inventario y servicios de apoyo para este sector;

Salud

1. Se autoriza reestablecer los procedimientos electivos en instalaciones para pacientes hospitalizados y ambulatorios, siempre que los servicios sean:
    a. Procedimientos planificados para pacientes que, de acuerdo con el criterio clínico, pueden ver deteriorada su salud si continúa un atraso de días o semanas.
    b. No se permite aglomeración de pacientes, siguiendo las medidas de distanciamiento social.
    c. Los procedimientos o servicios no se pueden proporcionar por vía de Tele-salud.
    d. Se siguen las siguientes condiciones:
        i. Facilidades, personal profesional, pruebas y suministros adecuados.
        ii. Profesionales adecuados en todas las fases de los servicios médicos (como la disponibilidad de médicos, enfermeras, anestesia, farmacia, imágenes, apoyo en patología y atención post-aguda).
        iii. La adopción y auto certificación de los protocolos de mitigación y seguridad aplicables según lo publicado por las recomendaciones del DOH, CDC, OSHA y CMS.
        iv. El proveedor garantiza el uso del EPP requerido para los empleados y los pacientes.
        v. La adopción de protocolos de salud y seguridad por instalación o consultorio que permiten la detección de COVID-19 antes del procedimiento.
        vi. La facilidad tendrá un protocolo para determinar qué procedimientos cumplen con estas características. El mismo deberá estar disponible para la evaluación por parte del Departamento de Salud / SARAF.

2. Disponibilidad de médicos primarios y especialistas
    a. Como política pública, se cuenta con que paralelamente los médicos primarios y especialistas están ofreciendo servicios, utilizando el teléfono y video por medios electrónicos para tener citas y mantener la continuidad del cuidado.
    b. Esta es la razón de ser de las garantías de pago de tele-salud, y es clave para mantener la estabilidad de la salud en los pacientes crónicos.
    c. Cabe aclarar que las visitas médicas físicas también están excluidas del cierre obligatorio. Los médicos pueden abrir sus oficinas para citas siempre y cuando puedan certificar la adopción de protocolos de seguridad y mitigación del Departamento de Salud, CDC, OSHA y recomendaciones de CMS.

PUERTO RICO BEOC
BUSINESS EMERGENCY OPERATIONS CENTER
• DISASTER PREVENTION
• PREPARATION RESPONSE
• RECOVERY

FIGHTING COVID-19 IN PUERTO RICO

Insights for Implementing a Gradual Recovery Plan

Puerto Rico Economic Task Force W2 Team

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Disclaimer: This guideline document, developed for the PR-BEOC and the PR Economic Advisory Board, is intended to provide general guidance on COVID-19 risk factors and non-pharmaceutical interventions measures as described in the available Centers for Disease Control and Prevention (CDC) Guidelines, PROSHA Guidelines and World Health Organization (WHO) public documents as of April, 21 2020. This document is not intended to provide medical guidelines or address medical concerns or specific risk circumstances. and is not a substitute for professional medical advice, diagnosis or treatment. It is intended for informational purposes only, and does not provide any guarantee of outcome. The information contained within is gathered and shared from reputable sources; however, DGF Consulting Group is not responsible for errors or omissions in reporting or in any conclusion put forth by any of such sources. This document is not intended to provide specific recommendations for the PR-BEOC or the PR Economic Advisory Board to follow. Due to the dynamic nature of infectious diseases, DGF Consulting Group, its parent company, affiliates, subsidiaries and other officers, directors, and employees cannot be held liable for the use, reference to, or reliance on the guidance provided. We strongly encourage PR-BEOC and the PR Economic Advisory Board, the Business Community and the Organizations in Puerto Rico to continuously seek the assistance of a professional to adapt, and adopt this guidelines to its business, as well as to continuously seek additional safety, medical, and epidemiologic information from credible sources such as the CDC, Puerto Rico Department of Health, PROSHA, OSHA and the WHO.

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I. Introduction

On December 2019 a unprecedent outbreak of pneumonia of unknown aetiology emerged in Wuhan City, Hubei province of China. A novel coronavirus was identified as the agent responsible for the outbreak. On the 30th January 2020, the World Health Organization (WHO) declared the Chinese outbreak to be a Public Health Emergency of International Concern posing a high risk to countries with vulnerable health systems. On February 11, 2020 WHO termed the virus that causes the coronavirus disease of 2019 as COVID-19. On March 11th, 2020, as a result of the 13-fold increase number of cases outside of China and the triplication of the number of affected countries, WHO characterized COVID-19 as a pandemic[1]. A pandemic is a global outbreak of disease. Pandemics happen when a new virus emerges to infect people and can spread between people sustainably. Because there is little to no pre-existing immunity against the new virus, it spreads worldwide.[2] For this to happen, the virus must be able to infect people and the spread of person to person must be efficient and sustained.[3] The World Health Organization, WHO[4], issued guidelines on preparedness, readiness and response to COVID-19. On March 19, 2020, WHO alerted all countries to prepare to respond to different health scenarios recognizing that a one fits all approach for COVID-19 related cases was not feasible. WHO recommendations reinforced the need for countries to assess their risk and implement necessary measures at the appropriate scale to reduce both the COVOD-19 transmission and the economic, public and social impacts. WHO recommended that all countries preparedness and response plans for COVID-19 should aim to:

- Slow and stop transmission, prevent outbreaks, and delay spread.
- Provide optimized care for all patients, especially the seriously ill.
- Minimize the impact of the epidemic on health systems, social services, and economic activity.

The COVID-19 pandemic reached Puerto Rico in mid-March of 2020. The territory is vulnerable to such a shock not only due to its novelty, but also because of unfavorable preexisting socioeconomic conditions. Being faced with around 1400 confirmed positive cases and 86 deaths as of April 28th, authorities are currently undergoing a difficult balancing act striving to safeguard the healthcare system without imposing severe contractionary pressures on the economy. In Puerto Rico we started documenting cases in early March and went in full lockdown in March 16. The lockdown was a necessary measure undertaken by Governor Vasquez in order to

[1] WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020 https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020

[2] CDC Coronavirus Disease, Situation Summary. https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html

[3] PLANTILLA Plan de Continuidad de Operaciones ante una Pandemia para agencias, organizaciones y negocios, Departamento de Salud de PR, Rev Feb 2020

[4] Critical preparedness, readiness and response actions for COVID-19, Interim Guidance , 16 MARCH, 2020 https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19

identify and treat the affected patients and to reduce the contagion rate in the island thereby trying to minimize the fatalities. According to the World Health Organization the data suggests that for COVID-19, 80% of infections are mild or asymptomatic, 15% are severe infection, requiring oxygen and 5% are critical infections, requiring ventilation. The Covid-19 pandemic continues to be an urgent local matter and a serious global crisis

The major policy that has been used as a tool to control infection rates thus far has been one of shutdown & curfew. Given dynamics between healthcare, the economy, and society, return to relative economic normality must neither be abrupt nor overly delayed. This report adapts insights, for the implementation of gradual, by-phases, recovery processes for the territory.

The most important goal is to suppress the spread of Covid-19 in the island so that the infection rate doesn't increase at an exponential level. The measures take into effect were adequate because they i. halted the spread of the virus in the island and ii. gave the healthcare industry enough time to prepare itself to deal with an increase in capacity (beds, respirators, PPE and necessary equipment). Hospitals are the last line of defense, so it is extremely important to understand their Covid capacity and have daily metrics alongside alarm thresholds that alert the government of possible upswings because ultimately, we need to use all means to avert the collapse of the health care system.

Our ***main goal*** in the Economic Taskforce's Workstream #2 ("ETW2") is to bridge to recovery from the emergency to a gradual social and economic recovery. For ETW2 to achieve that goal we need to positively impact the Puerto Rico economy without overburdening the Covid-19 Health sector capacity. ETW2 is made up of industry captains and economists (5), who meet three times a week (M/W/F) as a group. The current ***critical discussion issues*** are i. the current assessment the health and economic recovery, ii. analysis of the applicable Executive Orders or legislation and their current and future social and economic implications, iii. the procurement of sector specific guidelines in order to recommend to the Healthcare Taskforce and with the goal that upon approval the guidelines will be distributed to the relevant sectors in order to be adapted by the companies, so they are ready to open when called upon, iv. obtaining relevant information from our Government liaisons and the Healthcare Taskforce in order to incorporate the same into our models and v. establish and model economic and health data in order to recommend the activation of specific sectors (weighing economic impact and risk) in a phased manner.

Proposed Example of Phased Economic Roll out. Key Performance Indicators (KPI) need to be established in order to "Start Roll Out". A transition can start when daily day-over-day changes in new positive tests happen in an incubation period (14 days). The KPIs During Rollout-After two incubation periods. In order for the next phase to start, the health infrastructure needs stay below a safe capacity threshold. If that threshold is maintained, then a rollout should proceed to next phase. Should a spike in demand increase between 25% and

[5] Jaime L. Fonalledas ETW2 Leader, Emilio Colon Zavala BEOC President, Rick Neuman (Hospitality), Ramon Gonzalez (Energy), Juan Lara (Economist), Roberto Toledo (Economist), Ignacio Alvarez (Banking & Finance), Umberto Donato (Construction), Hector Cordero (Agriculture), Waleska Rivera (Manufacturing/Construction), Josean Arroyo (Finance & Technology), Ramon Leal (Restaurants), Carlos Lopez-Lay (Automotive), Roberto Pando (Healthcare).

50%, then the economic roll out will stay in its current phase. Should a spike in demand be over 50% after two incubation periods, a regression to previous phase will be triggered.

The health of the people of Puerto Rico is our number one priority and with that in mind we must balance it with a mitigation of Puerto Rico's economic impact, all our discussions and recommendations will follow this central principle. We are conscious that this isn't a light switch, it is a measured pulling back on certain restrictions to try and get society and the economy gradually back to normal. Directional factors are extremely important in determining the pace of the opening of certain sectors of the economy.

II. About COVID-19

Coronaviruses are a large family of viruses which may cause illness in animals or humans. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19.[6]

COVID-19 is the clinical syndrome associated with SARS-CoV-2 infection, which is characterized by a respiratory syndrome with a variable degree of severity, ranging from a mild upper respiratory illness to severe interstitial pneumonia and acute respiratory distress syndrome (ARDS).[7] Coronaviruses(*Coronaviridae)*, are named for the crown-like spikes on their surface. There are four genera of the *Coronaviridae sub family Coronavirinae,* known as alpha, beta, gamma, and delta.[8] Betacoronaviruses (β-CoVs or Beta-CoVs) are one of four genera of coronaviruses of the subfamily *Orthocoronavirinae* in the family *Coronaviridae*, of the order *Nidovirales*. They are enveloped, positive-sense, single-stranded RNA viruses of zoonotic origin. Coronaviruses that infect mammals (except pigs) belong mainly to two genetic and serologic groups: The *Alpha-* and *Betacoronavirus* genera.[9] The SARS-CoV-2 virus is a betacoronavirus, like MERS-CoV and SARS-CoV. All three of these viruses have their origins in bats.

6 https://www.who.int/news-room/q-a-detail/q-a-coronaviruses

7 https://www.sciencedirect.com/science/article/pii/S1198743X20301713

8 https://www.cdc.gov/coronavirus/types.html

9 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3911734/

III. Flattening the Infection Curve

a) Shutting Down

Governments all over the world realized sometime into the crisis that it had become a pandemic. The virus spread rapidly across borders; with serious uncertainty regarding key parameters such as the share of infected that are asymptomatic, the virus' reproduction rate, and the spectrum of the disease's severity, many governments are scrambling to achieve low infection rates whilst still paying proper attention to the overall economy. Resorting to imposing curfews and shutting down sectors of a country, be it economic or regional sectors, has been a major tool in country-level approaches to the to fight against the novel coronavirus.

Shutdowns certainly seem to be effective in flattening the infection curve, yet it is also evident that such a policy implies not only economic costs to the population, but also medical, social, and psychological costs:

- Economic: Closure and cease of production of sectors and companies, be it from legal requirements, issues with the supply line, or a desire to avoid contamination in the workplace, cause significant downward pressure on GDP.
- Medical: Patients who are chronically ill and/or economically disadvantaged are placed in high risk of being left behind. Policies should not ignore the fact that both these types of patients and those with serious COVID-19 complications would both suffer given capacity bottlenecks, such that some share of resources must always be reserved for the first group. This is especially true in Puerto Rico, where diabetes and heart disease, both of which seem to be correlated to COVID-19 complications, are common.
- Social and Psychological: Cancelling social events, school, work, and being forced inside are all components of a shutdown that negatively impact the population's well-being. The pandemic and virus themselves, of course, are sources of fear and anxiety for many. Those who are already marginalized, it should be clear, are most at risk of being the first to suffer these costs (and in a more severe way). For example, pauses in educational investment, entry into unemployment, and being forced inside (i.e.: "cramped in") are all significantly harder for poor people to overcome.

While these costs may likely be justified in the short-term period after the virus emerges in a country or region, no economy can remain in this state forever. The deterioration of socioeconomic conditions would be self-defeating and eventually impose a burden on the healthcare system itself. In contrast, an abrupt reopening of the economy would likely lead to a catastrophic reemergence of the virus with high infection rates. Puerto Rico government must therefore observe key parameters to determine when restrictions can begin to be relaxed such that new appropriate policies are implemented in a gradual, step-by-step fashion, with clearly defined and easily observable milestone parameters.

b) Goals, Steps, and Milestones

The primary goals of this phase are to flatten the curve by controlling the rate and level SARS-CoV-2 transmission, develop or otherwise provide availability of testing for all symptomatic persons along with those who have contacted confirmed cases, and ensure the healthcare system can attend to all patients with adequate care. Relatively harsh measures are needed to achieve this: Social distancing, through curfews, banning mass gatherings, closing economic sectors, etc. must be imposed. There must also be capacity building for the healthcare system. Testing capacity should be enough such that testing hospitalized patients, healthcare or workers, contacts of confirmed cases, and outpatients with symptoms can all be tests. A fundamental component of this is developing infrastructure for test-related data sharing such that healthcare workers, those in contact with confirmed cases, and the population, can have access to essential information. Tracking healthcare capacity variables (ex: beds, ventilators, medicines, masks, and gloves), implementing a background tracking system using serological testing and surveys, offering voluntary isolation to confirmed cases and their contacts, and encouraging the public to wear masks (particularly non-medical fabric ones if supplies are strained) are all measures that should assist in moving forward to the next phase. The fight is against a pandemic, such that these and most approaches must be imposed across the entire territory if they are to succeed.

Suggested Key parameters, but not limited to, must be tracked in order to determine when to move forward on a control Economic Sector Roll Out. Specifically, there must be (i) sustained reduction in cases for one incubation period (14 days), and capacities to: (ii) treat all hospitalized patients without resorting to crisis standards of care, (iii) test everyone with symptoms, and (iv) monitor all confirmed cases along with those they have contacted. Just as important as monitoring for progress, the government must keep a keen eye on indicators of regressive development. If Puerto Rico cannot trace back a significant number of cases, or if positive counts double every 3-5 days, or if hospitals cannot properly treat all hospitalized patients, a suggested protocol it's to remain on this phase (or return to it).

c) Pre-vaccination Measures

Vaccines are still to be developed and approved as safe and effective. Once at this phase, there will be a waiting period, at least until 2021, for Puerto Rico to acquire access to vaccines and make them widely available to inhabitants. Given the nature of the pandemic and the fact that the primary tool to address it has been flattening the infection curve (which implies, in part, delaying the spread of the virus), it is quite unlikely that the population will have reached an adequate level of natural immunity at this stage. It is essential for authorities to not be misguided by achievements in previous key parameters needed to reach this stage; they are not indicative of the territory's preparedness for a cessation of the shutdown and social distancing measures.

During this time, policy can neither remain in stasis or become abrupt and too focused on reopening the economy. Instead, Puerto Rico should take a gradual approach to lifting restrictions while it achieves population immunity. Authorities should start lifting some physical distancing measures, opening most

businesses/schools, and avoid backwards development to phase I by monitoring relevant parameters. Generally, this phase is characterized by a move away from a blanket universal approach to targeted measures that fight the spread of the virus more efficiently. It is thus necessary to implement case-based interventions, such that all confirmed cases and their contacts isolate for 7 and 14 days, respectively. Some countries have opted to risk the legal validity of measures by imposing GPS tracking to ensure quarantines or providing Bluetooth-based alerts to contacts of confirmed cases. These are measures to be considered in extreme cases, but the legal validity of measures should never be overlooked, as that is an important factor for their success.

It is fundamental that hygiene and health guidelines are accessible to the public and private sector. Economic recovery is dependent on relaxation of social distancing restrictions, which are themselves dependent on inhabitant's compliance to new imposed measures. The intention is to prepare for reopening of workplaces where telework is not feasible, along with schools and their complementarities. Vulnerable populations, be it for socioeconomic or health factors, should be given particularly special care during this phase. The development of preventive care, such as therapeutics, should be accelerated and initially targeted towards these groups in an attempt to save them from experiencing serious health complications during this phase. Mass serological testing is needed for a return to normal economic activity. These will provide information on background rates and also identify those who are likely immune. Such identification is quite important for progress; those who are likely immune are the best candidates to return to work, serve in high-risk roles, or support community members that must remain isolated until vaccine development.

Puerto Rico should not relax its health safety protocols until it has made vaccines widely accessible to its population. Alternatively, Puerto Rico should develop or otherwise acquired (i) a surveillance sentinel system, (ii) widely available point-of-care testing, (iii) capacity to trace and isolate cases, (iv) capacity to enforce quarantine, and (v) accessible therapeutics (especially for those most vulnerable). If every single one of these conditions is met, or if vaccines are accessible, the territory should be able to move on to a normal life and full economic roll out.

d) Differentiated Reopening

The Medical and Economic Task Forces should not strive to achieve a recovery scheme that is too centrally planned as it could lead to issues in the timing of opening the economy. Instead, it is recommended the body provides general guidelines and suggested measures in the path toward recovery. The *IFO Institute of Germany,* for example*,* does recommend some types of targeting. Specifically, it is useful to differentiate across (i) regions, (ii) groups, (iii) areas of social life, and (iv) economic sectors in the process of developing measures to accelerate the recovery. Measures taken based on this sort of differentiation should be flexible and founded on the outlined stepwise plan. Important variables to consider are (i) risk of infection, (ii) risk of severe symptoms, (iii) socioeconomic relevance, and (iv) how feasible it is to maintain safeguards or impose new measures if needed. All of these parameters, of course, depend on factors that have been extensively discussed such as immunity rates and how burdened the healthcare system is.

Decisions must also be influenced, however, by considerations of complementarities between regions or sectors, and whether they are high value added or not. The difficulty in addressing these considerations,

especially during crisis times, is part of the reason why it is not recommended that the Task Force take a centrally planned approach to the economy. The IFO does however provide some guidelines by components:

- Social: Reopening should begin with small groups whilst complying by health and hygiene guidelines. Most social events should be held outdoors, if at all.
- Health Care: Sectors that produce equipment such as masks, vaccines, disinfectants, and medicines, should be prioritized as they are themselves essential for a functioning supply chain during the recovery process.
- Industrial: Manufacturing sector should be assisted in the process of applying improved health and hygiene standards.
- Hotels, restaurants, travel, and tourism: These sectors are characterized by density, close proximity between persons, and periodic rotation of groups of persons that come into contact. They should be reopened slowly as they are likely to be hotspots for quick reemergence of the virus if they were to be abruptly reopened.

IV. Status Report – Puerto Rico

a) Economy & Health: Reflections on Preexisting Factors

Puerto Rico has been a struggling economy ever since the mid-2000s. It experienced an earlier and relatively sharper recession than the US during the Great Financial Crisis, leading to a "lost decade" with no economic growth. While the rest of the world recovered from the GFC, the island spiraled into a debt crisis, for which the US Congress imposed a Fiscal Management and Oversight Board. The most recent economic shocks occurred 2017 and 2020 through Hurricane Maria and major earthquakes, respectively. These natural disasters imposed economic costs of around $46b in a territory already deep into a debt crisis [1].

Socioeconomic indicators have been of concern for decades, and they suggest that Puerto Rico is amongst the worst performing when compared to US states. Around 45% of the territory's inhabitants live below the poverty line, compared to the national mean of 13%. Emigration of working-age adults, which itself leads to a deterioration of the economy, has boomed because of worsening socioeconomic conditions and the relative ease to move to the US. This has led to a brain drain and economic slowdown and has increased the share of population older than 65 from 14% in to 2008 to 21% in 2018. During these times, such indicators are even more significant because this subset of the population is categorized as a high-risk age group for COVID-19 complications.

Estudios Tecnicos, Inc. (ETI) that is actively following the development of the Covid-19 Virus and providing estimates of its economic impacts. Based on the information known as of March 25, 2020, the firm estimates that directly affected sectors will suffer a loss of $2.7 billion dollars in direct economic activity during the remainder of 2020, which may in turn drag the economy into a total loss of $5.8 billion when indirect impacts are factored in. Total impacts on demand were estimated at $2.5 billion; while supply side impacts amounted to $1.8 million. The impact of containment measures on economic activity was estimated at $1.6 billion.

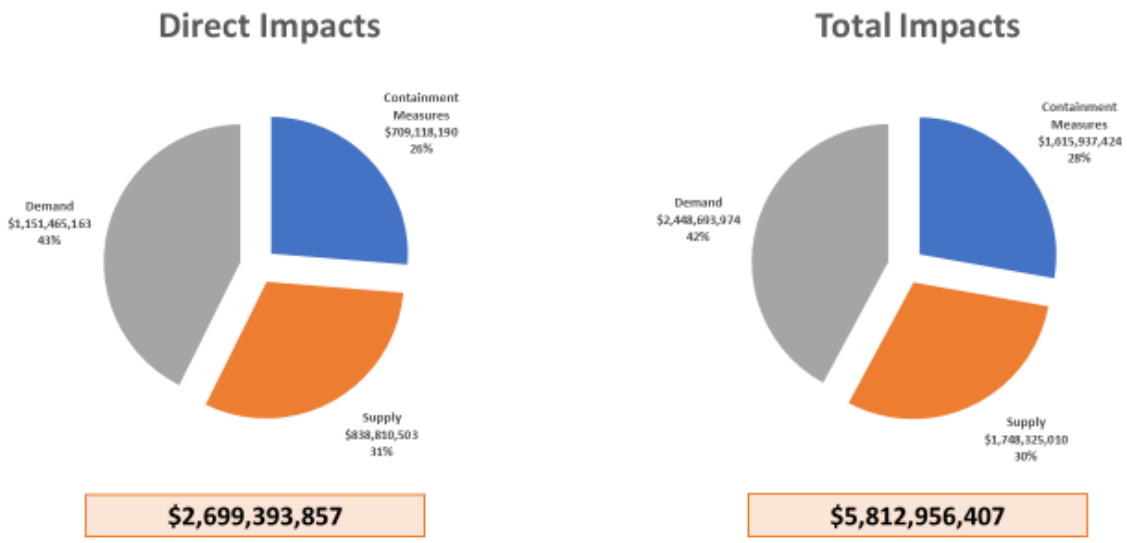

Figure 1: Direct and Total Impact of the Coronavirus in Puerto Rico, as of March 23, 2020

Another study from Estudios Tecnicos, Inc. indicates that from March 15 to April 11, 2020, 173,926 unemployment claims have been officially registered. However, employees of the Department of Labor have stated that the volume of applications, including those in process, exceeds 300,000. Estudios Técnicos, Inc. estimated that:

• As of March 2020, in Puerto Rico, 369,700 employees were at high risk of unemployment due to the COVID 19 pandemic. To date, likely that the majority of these jobs are lost.

• Jobs in the commerce, transportation & utilities industries; recreation & hotels and education & health services have the highest risk of becoming unemployed due to COVID 19. (etz. shopping malls, hotels, cinemas, non-essential health services, among others.)

• The occupations most affected are vendors, food preparation and service occupations, and transportation-related occupations.

• If 80% of high-risk employees were incorporated into unemployment statistics, the unemployment rate would gradually rise from 8.8% in February 2020 to 37.1% in May 2020.

• If the pandemic worsens, occupations with low risk of unemployment could also be affected. Economic stimulus measures will help mitigate the negative effects of the pandemic, the final effect will depend on the speed and use of the funds.

Puerto Rico is in need for a revamped healthcare system. The recent natural disasters made that fact all but undeniable. These negative healthcare shocks were not adequately handled by the territory's authorities, largely in part due to lack of capacity. Issues in healthcare impact those who are already economically disadvantaged the most. The poor, elderly, and those with mental health issues, were more likely than average

to regress further into marginalization as direct consequences of the events. To this date, about 50% of inhabitants rely on Medicaid, which is an indicator that they cannot afford proper medical attention or monitoring. Experts in biostatistics, climatology, and economics collaborated in a vulnerability analysis and determined that more than half of individuals above 65 have at least one preexisting condition that is suspected to have positive correlations with COVID-19 complications, such as asthma or diabetes [2]. These issues, combined with low accessibility of healthcare, imply that the island had low capacity for dealing with a pandemic while also having a high share of at high-risk inhabitants. These preexisting issues make it implausible to implement the most optimal approaches to fighting pandemics, as pandemics pose strains even on healthcare systems of the highest quality.

While having such unfavorable conditions, the territory was faced with the first three positive cases in March 13th [3]. These conditions constitute an important context that is extremely relevant for avoiding expectation shocks in terms of how the territory handles and responds to the crisis. This context also provides relevant background factors or parameters for the development of a legitimate recovery plan and should be used when seeking to identify regions or economic sectors in most need of assistance during this crisis.

b) COVID-19 Task Force: Puerto Rico's Task Force

The Department of Health announced that the Governor of Puerto Rico Hon. Wanda Vázquez established a Task Force in February 25th [5]. Its duties were set to avoid mass disease propagation of the virus in case of person-to-person transmission in the island by "defining plans of action in each corresponding area for agencies involved in the recovery process". It is composed of experts in fields that include, but are not limited to, medicine, epidemics, and economics. The goal is to approach recovery whilst balancing valid, yet at times conflicting, concerns raised by each discipline.

The TF began preparation for the arrival of the virus to the Puerto Rico by collaborating with public entities such as the Department of Education, Department of Health, Justice Department, Homeland Security, TSA, and National Guard. Just like in most jurisdictions, the PR TF has provided generalized guidance for the local administration, population, and private sector to follow during the fight against this novel pandemic.

c) Shutdown & Curfew: Health & Economy: An Ongoing Balancing Act

Shutdown policies force an analysis of the complicated dynamics between the healthcare sector and the overall macro-economy. It is clear one cannot function without the other, yet these policies have effects on the healthcare sectors and the overall economy which generally go in opposing directions. That is, they avoid straining the healthcare sector such as to maintain its quality and avoid as many health complications and deaths as possible, while also causing the cessation of activities in many economic sectors.

The shutdown is the most likely cause of the control in infection rates that the territory has apparently achieved. The trend of new daily cases seems to be generally flat, as depicted in Figure 2, which shows data on cases starting from March 16th up until the writing of this report. While the trend seems flat, authorities must

still observe this data closely and frequently. Double counting issues have recently been addressed, but authorities must always be aware that these types of issues are plausible, and their implications must not be ignored. As always, this data can obfuscate reality through the hidden variable of testing. This is addressed later in this section.

A multiplicative approach based on a given span of days is also useful to determine infection rates (Figure 3). In this graph, the base date is March 13th, when there were five confirmed positives and the shutdown policy would be announced in a few days. The last date is April 27th, forty-five days after the base date. The three-day indicator shows that up until fifteen days after this date, positive case counts were increasing by a factor of at least 2 every three days. Said multiplicative has generally been trending downward since. From twenty-three days after the chosen base-date and on-wards, positive case counts were instead increasing by a much lower factor of 1.3 every three days. The five-day indicator displays a similar favorable trend, having an observed maximum of 5.5 early on yet fluctuates around 1 to 1.3 for the last days displayed on the graph. These are indicators of an effective and relatively quick approach in controlling the virus' spread.

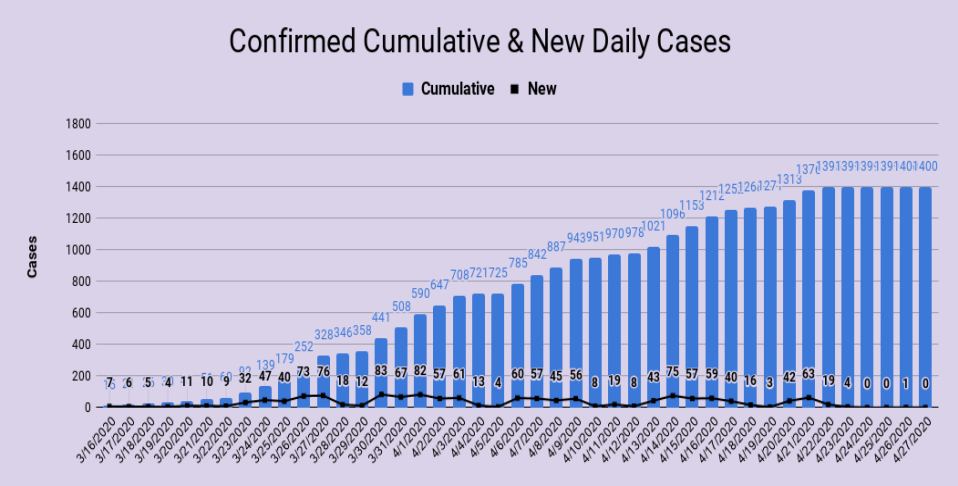

Figure 2: COVID-19 Case Counts in PR
Source: PR Department of Health

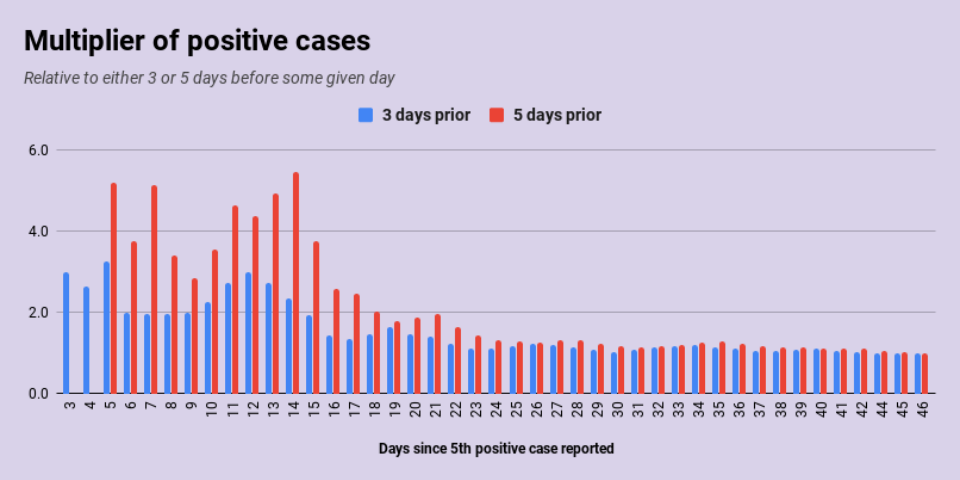

Figure 3: Growth of COVID-19 Case Counts in PR
Source: PR Department of Health

Data on infection rates and spread cannot be fully trusted to reflect reality if testing is not widely available and accessible, however. Only about 10,000 of all 3.2m inhabitants have been tested (i.e.: a mere 0.3%). Compared to mainland US states, data as of April 6th showed the territory was administering a mere 124 tests per 100k residents, which placed PR second to last compared to all other states [9, 10]. The territory remains in this position as of April 28th, having 335 tests per 100k residents. PR was and still is lagging behind even the poorest states: as of April 6th, Arkansas, Mississippi, and West Virginia each respectively administered 426, 684, and 555 tests per 100k residents. Data gathered only a week showed PR moved from the last position relative to states to second-to-last instead, while MS improved by twenty-nine positions, and WV by nine positions. Considering comparable states in terms of size and population, such as Arkansas, Connecticut, Iowa, and Kansas, is also worthwhile. These states were in convergence with the territory fifteen days after the detection of their first respective positive cases, all having around 30 to 50 evaluated cases per 100k residents at the time [11]. Since then, and up to the writing of this report, the territory has lagged vis-à-vis all states; Figure 4 shows values of tests per 100k residents as of April 28th.

These metrics depict Puerto Rico struggle in relation to a fundamental component of recovery, namely providing widespread testing. Thus, positive case counts are likely being underestimated. These data issues can be catastrophic as miscalculated decisions on reopening could be based on parameters that are not at all reflective of reality. A reopening of the economy while there is an unobserved skyrocketing in daily new cases and/or rates of spread would be one of the worst-case scenarios. Whatever burdens make it so virtually every single US state is doing better and improving testing capacity faster than PR must be addressed. Regional testing is essential for tracking trends in cases, implementing contact tracing, and thus determining whether there is community spread or not. Work has been done in this area in the past weeks, and most positive cases now have data on region of origin [12, 13].

d)

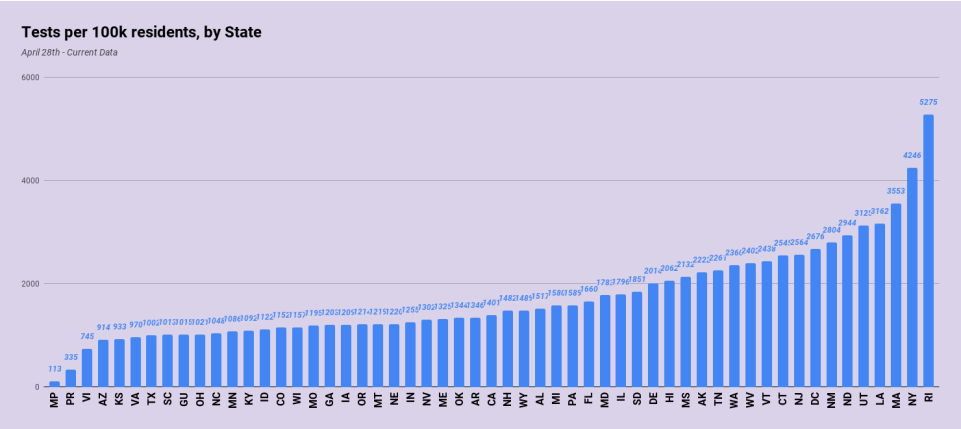

Figure 4: Tests per 100k residents, by States
Source: COVID Tracking Project (https://covidtracking.com/)

Puerto Rico has apparently been successful in preventing infection rates from skyrocketing. Still, the Fiscal Agency and Financial Advisory Authority estimates the crisis will cost the territory $4b, or about half its annual budget, and Treasury is expected to lose $1.6b in revenues [8]. Likely taking these factors as well as preexisting constraints into account, the Fiscal Management and Oversight Board is seeking to postpone or delay bankruptcy processes in court such as not to drive further deterioration of socioeconomic indicators [14]. Reopening the economy is thus quite important, but authorities should be gradual and flexible in their approach. Virus reemergence must be controlled for while shifting away from a shutdown policy towards full reopening of the economy, especially given the aforementioned testing bottlenecks.

Experts have provided guidelines and identified key parameters for this process; the Task Force and relevant authorities must resort to expert recommendations because of the novelty and severity of the pandemic. There are issues with testing, which are apparent with or without resorting to comparable US state; none of these issues should be ignored. Increasing the overall daily count of tests and implementing contact tracing are both essential. The existence of issues in these areas directly hinders both healthcare and communications policy during the recovery process. Simply put, these issues are incompatible with the proper implementation of a gradual approach to reopen the economy, as they likely obfuscate the reality in severity of infection rates.

e) Legal Considerations

Strict curfew and shutdown measures are unpopular not only because of their short-term negative impacts on the economy, but also because they impose limitations (or at the very least pauses) on rights and privileges. An efficient process of developing policy always involves ensuring legal standing such as to ensure validity. Taking account of such legal considerations is essential during emergency times of this nature were policy must be both relatively intrusive and quickly enacted. A failure to do so would, at best, place the government in a position in which it has to constantly defend its policies at court. At worst, affected policies

could completely fail, which is dangerous when many of them will impose much needed mitigation for infection control.

f) Information, Communication, and Accountability

It is essential to develop infrastructure for information sharing with healthcare workers, patients, high-risk persons, the private sector, and the overall population. Most persons and groups in the economy would benefit, and will therefore seek to receive, authorities' guidance. Therefore, data for cases, deaths, hospital capacity, and the like should be centrally collected and made readily available such that said guidance is feasible and informed. Puerto Rico Departments of Health and of Statistics have developed a useful dashboard for COVID-19 data [12, 13]. There are pending or outright missing data points, however, that are essential. About a third of positive cases thus far lack regional data. There are around 1.3k tests results which are pending, or 16% of all administered tests. Moreover, all regions lack data on total administered, negative, and pending test results. These issues, particularly that of regional data, are incompatible with the proper implementation of a gradual approach to reopen the economy.

Other entities and individuals have used available data to develop their own dashboards [11, 17, 18]. While official dashboards are often at an advantage in terms of design and how easy they are to interact with, it is undeniable that they lack important visualizations of data that are provided by independent dashboards and updated daily. The official dashboards should provide basic data visualizations such as daily time-series on new or cumulative cases (be it sorted by region, for example, or not), administered public and private tests, and status of test results. The lack of more complex visualizations that may be harder to understand for the general public, such as time-series graphs on per-capita testing compared to US states (see V2A's Dashboard [11]), is more understandable. Yet the data that these independent dashboards use are provided by the same sources that feed official dashboards and are at times complemented with The Atlantic's COVID Tracking API [19]. The same datasets are thus being used in most cases and access to complementary sources is extremely straightforward. Data availability and accessibility are necessary, but not sufficient, conditions for successful communication strategies. It is also essential to set clear objectives, steps to reach them, and provide realistic messaging in the sense of how costly measures are and how the recovery is a long-run process.

Information, communication, and accountability policies are essential to acquire the population's trust on authorities such that they follow guidelines and restrictive measures. Such compliance is fundamental for preventing an overburdened healthcare system and implementing a gradual approach toward reopening the economy. Even if healthcare and hygiene measures are successful, policy that is lacking any of these three facets could cause a failure to ensure worker confidence or the private sector's preparedness once it is time to reopen the economy. The proper path forward constitutes a risk-adaptive flexible approach, which could negatively impact the population's trust. Access to healthcare information, clear communication on the nuances of recovery strategies, and constant unforgiving accountability are all essential to ensure the trust and compliance of the population and private stakeholders.

g) Transparency Throughout

Experts are consistent in declaring information, communication, and accountability policies as essential in the recovery process of any emergency, especially one as novel as this pandemic. The economic task force acknowledges this and suggest the following principles based on the Organization for International Transparency's guide on government contracts during states of emergency, follows bellow:

- Give maximum publicity to information on emergency-related government purchases. Prevent disinformation on scarcity or lack thereof with the proactive and timely publication of information on tests, infections, medications, supplies and services.
- Activate antitrust agencies to avoid collusion between economic actors or practices that result in price speculation.
- Carry out real-time audits for public procurement processes, precisely because of the exceptional nature of the situation and magnitude of the emergency. Take measures against bribery for acquisition of purchases or access to medical supplies and services. This should be done at public and private levels, establishing clear and transparent protocols, which among other things stipulate how to proceed in cases of scarcity.
- Utilize a single platform for all information related to government procurement on this topic or generate identifiers on the electronic public procurement platforms.
- Protect whistle-blowers and offer a confidential line to make complaints.

V. Recovery Through Phases

Two days after the first confirmed positive cases were reported, the local government imposed social distancing restrictions and a curfew which remains amongst the strictest in the world, and certainly the United States. It was extended twice and is currently set to expire in May 3rd. These measures are intended to flatten the curve of infection rates such as to delay and lessen the severity of the peak of positive cases over time (See Figure 5). The goal is to prevent overburdening the healthcare system and keep it functioning with acceptable quality in order to avoid mass deaths or serious illness (be it from COVID-19 or non COVID-19 complications).

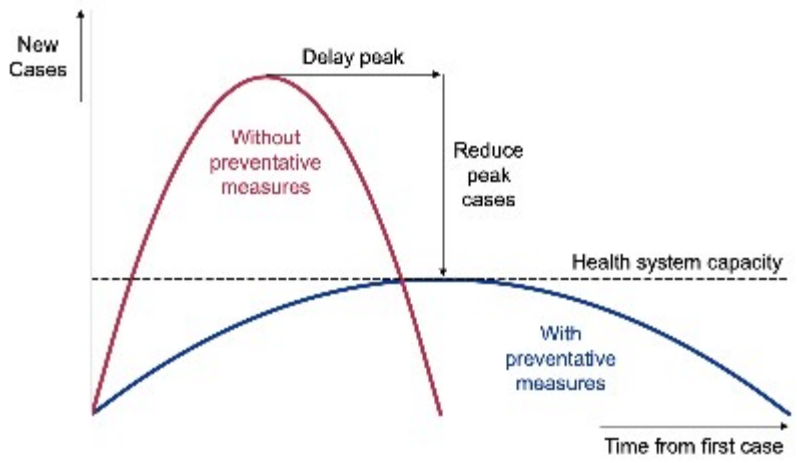

Figure 5: Flattening the Pandemic Curve

The island is no exception to the fact that some of these measures, in imposing curfews, business closures, and the like, can interfere with basic rights. The dynamics between the macro-economy and a functioning healthcare system also make it so economic growth is impossible without the latter. Just as well, harsh economic measures can indirectly increase the burden on the healthcare system by imposing socioeconomic and psychological stress on the population. In fact, those who are already marginalized or otherwise at a disadvantage are likely to suffer the most from these measures; entry into unemployment or pauses in educational investment, for example, hurt those from already disadvantaged socioeconomic backgrounds the most. Moreover, not much is known about SARS-CoV-2 given its novelty. Over time, there should be progress in medical and epidemiological fields to develop useful data for the determination of the virus' mode of spread and severity of symptoms, as well as the identification of high-risk groups. Time and cross-country comparisons will also allow for an assessment on which restrictive measures are useful in this fight, and how they specifically help.

It is thus optimal to adopt a gradual and flexible approach to reopening, rather than either complete reliance on the shutdown or abrupt lifting of restrictions. An approach by steps allows the targeting of the infected to replace mitigation universally applied blanket tactics. In order to be legitimately gradual, such approach must have clearly defined and verifiable threshold conditions, based on healthcare and economic parameters, for going to and from phases. This nuanced approach makes a clear and transparent communication strategy necessary, such that the population and private sector can set realistic expectations. Expectation shocks can negatively impact compliance with restrictions and regulations, which are needed for progressing from the shutdown to complete reopening of the economy.

The following sections combine insights, to outline the phases that constitute the path forward from shutdown to complete reopening [23]. The overarching goal is to transition to a risk-based strategy that slowly eases socioeconomic restrictions while ensuring effective health protection. This must all be done with

unhindered access to information, provision of clear and precise communication, and strictness in developing and applying accountability measures.

c) Re Activation Criteria

- Economic Sectors re-activation sequence will only be granted by the Governor of Puerto Rico, by Executive Order, considering recommendations provided by the Economic Task Force and Health Task Force.
- Re activation of any Company in Puerto Rico, requires the development and implementation of specific guidelines describing risk evaluation process and non-pharmaceutical intervention measures (Mitigation Measures).
- It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a mechanism in place to update the plan as new OSHA, PROSHA or CDC guidelines are approved.
- It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a protocol to ensure all employees are properly trained and understand the plan developed by the Company.
- Puerto Rico should not relax its health safety protocols until it has made vaccines widely accessible to its population. Alternatively, Puerto Rico should develop or otherwise acquired (i) a surveillance sentinel system, (ii) widely available point-of-care testing, (iii) capacity to trace and isolate cases, (iv) capacity to enforce quarantine, and (v) accessible therapeutics (especially for those most vulnerable). If every single one of these conditions is met, or if vaccines are accessible, the territory should be able to move on to a normal life and full economic roll out.

d) Guiding principles

- Each Economic Sector is unique, therefore appropriate mitigation strategies will vary based on the level of community transmission, characteristics of the organization in the sector and their employees, and the capacity to implement mitigation strategies.
- Each organization of economic sectors that intend re activation, must assess all aspects of the working spaces that might be impacted, including employees most vulnerable to severe illness and those that may be more impacted socially or economically, and select appropriate actions.
- Each Company must identify exposure risk mitigation strategies that can be scaled up or down depending on the evolving local, municipal or island-wide situation.
- When developing non pharmaceutical intervention measures, employers should identify ways to ensure the safety and social well-being of employees that may be especially impacted by mitigation strategies, including individuals at increased risk for severe illness.

- Activation of company's emergency plans is critical for the implementation of non-pharmaceutical intervention measures related to COVID-19. These plans may provide additional authorities and coordination needed for interventions to be implemented
- Depending on the level of community spread of COVID-19 , the company may need to implement mitigation strategies for employees to identify cases and conduct contact tracing within the organization.

VI. Flexibilization and opening of the economy

In preparation for the suggested economic Roll Out the private sector have developed a combination of tools to monitored and mitigate Covid-19.

The worstream2 team of the Puerto Rico Economic Task Force proposed phased Economic Roll out. This economic "roll out" is determined by two main Key Economic Indicators, the impact in the GDP of the different economic sectors and also the employment impact. The latter is correlated to a risk-based analysis that primarily measures contact points among others.

To achieve that goal, we need to positively impact the Puerto Rico economy without overburdening the Covid-19 Health sector capacity. The KPIs During Rollout-After two incubation periods. In order for the next phase to start, the health infrastructure needs stay below a safe threshold. If that threshold is maintained, then a rollout should proceed to next phase. Should a spike in demand increase between 25% and 50%, then the economic roll out will stay in its current phase. Should a spike in demand be over 50% after two incubation periods, a regression to previous phase will be triggered.

The health of the people of Puerto Rico is the number one priority and with that in mind we must balance it with a mitigation of Puerto Rico's economic impact, all our discussions and recommendations will follow this principle. We are conscious that this isn't a light switch, it is a measured pulling back on certain restrictions to try and get society and the economy gradually back to normal. Directional factors are extremely important in determining the pace of the opening of certain sectors of the economy.

To have a sustainable control suggested "Roll Out" of the economy the economic task force is going to rely on a combination of the following tools:

- Health System Capacity index an Economic Perspective
- Key Economic Indicators and Risk Factor Index
- Covid-19 workforce basic reproduction rate index
- Risk Assessment Tool: Operational Plan
- Economic Rollout Phases and Timeline
- Compliance: Google Mobility Reports

The Economic Taskforce suggest that this tools have to be used in an integrated manner for the "roll out".

a) Health System Capacity index an Economic Perspective

I. Summary

The Health System Capacity index model is intended to measure Puerto Rico's healthcare system's operational capacity during the COVID-19 pandemic. The model uses number of total beds, number of ICU beds, and number of ventilators as its control variables.

The model functions based on a period length (30 days), an estimated starting value of cases (1000), an estimated availability of ventilators (500), and a ventilator capacity threshold (80%). It also depends on parameters provided by the Task Force on the proportion of cases that require hospitalizations (H/C = 50%), the proportion of hospitalizations that require intensive care (ICU/H = 18%) and the proportion of ICU that require ventilators (V/ICU = 77%), which are then used to derive the proportion of cases that require ventilators (V/C = 6.93%). All of these parameters are then used to calculate the metric of interest: *the daily % increase in cases within the chosen time period for which the chosen ventilator capacity threshold is **not** violated*.

An extension of the model is provided in the Excel file accompanying this document. The principal intention of this contribution is to increase efficiency when using the model to answer questions within its framework. No additional parameters or assumptions have been added; pre-existing parameters (ie: anything and everything in parenthesis above) have simply been made readily editable. This allows for real-time assessment on the impacts of new information regarding any parameter(s) on the metric of interest. Moreover, it allows for entertaining certain hypotheticals (ex: "what if we had X more ventilators available?")

II. Model Setup

1. Legend

Yellow parameters are readily editable:

- Period of Length (in days)
- Quantity of cases on Day #1
- Ventilators Available
- Ventilator Threshold (%)
- Share of cases that were hospitalized
- Share of hospitalized that require ICU
- Share of ICU that require ventilators

Orange parameters are derived from the previous; **avoid directly editing them**, as they directly feed into the results table:

- Share of cases that require ventilators
- Ventilator Threshold (in count)
- Quantity of cases on Day #LAST

The result, or maximum average daily percentage (%) increase in cases such that the ventilator threshold is not crossed, is displayed in blue and update real-time as parameters are edited. A graph which updates real-time as well is provided.

2. How to use

The user will only input initial parameters marked in yellow. The spreadsheet will then derive intermediate parameters marked in orange. The ventilator threshold (in count) for whichever day is last is used to derive the maximum number of cases on that day such that the threshold is respected. This can be treated, thus, as the ventilator threshold in terms of quantity of cases on the last day.

The spreadsheet proceeds to use the (i) chosen period length, (ii) estimated quantity of cases on day one, and (iii) derived quantity of cases on the last day to calculate the result: the average daily increase in cases. This metric represents the maximum average % increase in COVID-19 cases such that the ventilator threshold is not violated.

III. Results

Using the parameters provided, primary results are that the healthcare system in the territory has capacity for no more than a 6.23% daily increase in cases. The secondary result is provided simply to show the functionality of the file. In this case, the period length was increased from 30 to 50 days, and ventilators available increased from 500 to 700. This leads to a result of 4.36% daily increase in cases such that the threshold is not violated.

IV. Hospitalizations & ICU based models

The final extensions for the model are simply setting the healthcare capacity system's threshold in terms of hospitalizations or ICUs. Both models are setup in the file such as to identically replicate the ventilator model's result (i.e.: 6.23% increase in daily cases results described above).

The replication folder contains a video clip and text file describing how to set up replications if changes are made to the ventilator model's parameters. In summary, we simply want all parameters to be the same. The challenge is that the # available, thresholds in %, and thresholds in count are expressed in terms of hospitalizations, ICUs, and ventilators in each respective model. If these parameters (specifically the first two, which are readily editable) are changed in model A and replication is to be maintained in model B, there is some derivation involved in order to determine model B's parameters' appropriate values. Changes to any other parameters are simpler. They (ex: period length, H/C, etc.) are treated as universal; if one is manually changed in one model, it simply needs to be manually changed to the same value in the other model. The replication folder dives deeper into this process such that the models' validities can be readily verified.

The screenshots of parameters and the resulting graphs in both cases are provided below.

parameters	values
Period Length (in days, max 100)	30
Cases (D#ONE)	1000
Ventilators Available	500
Ventilators Threshold (%)	80%
Hospitalized/Cases	50%
ICU/Hospitalized	18%
Ventilators/ICU	77%
intermediate parameters	values
Ventilators/Cases	6.93%
Ventilator Threshold (in count)	400
Cases (D#LAST)	5772
results	values
max acceptable daily % increase in cases	6.23%

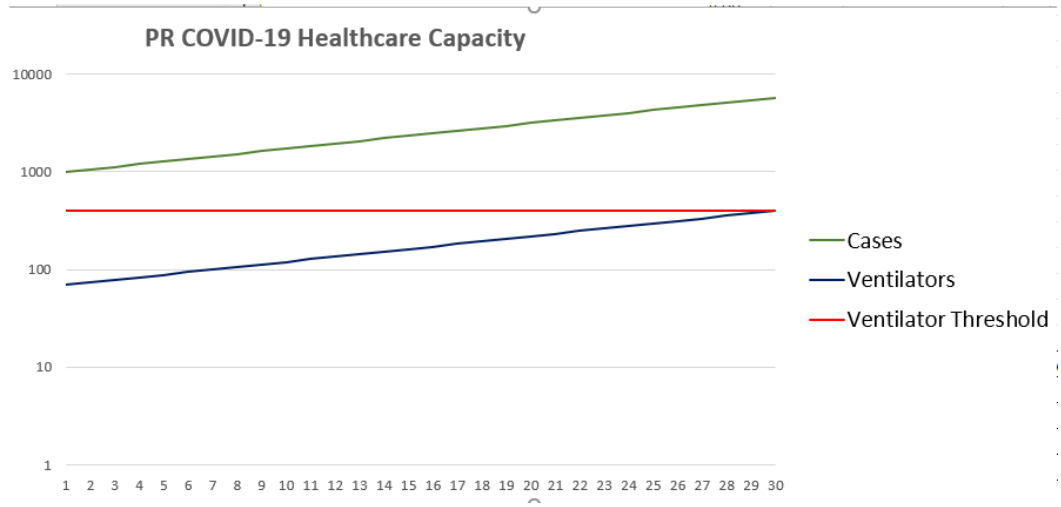

Figure 6: Primary Results

parameters	values
Period Length (in days, max 100)	50
Cases (D#ONE)	1000
Ventilators Available	700
Ventilators Threshold (%)	80%
Hospitalized/Cases	50%
ICU/Hospitalized	18%
Ventilators/ICU	77%
intermediate parameters	values
Ventilators/Cases	6.93%
Ventilator Threshold (in count)	560
Cases (D#LAST)	8081
results	values
max acceptable daily % increase in cases	4.36%

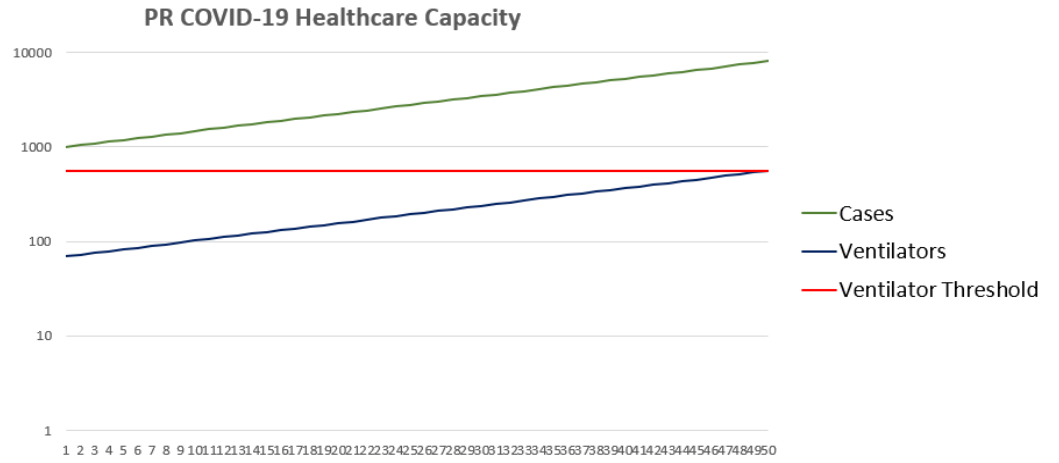

Figure 7: Secondary results

b) Key Economic Indicators and Risk Factor Index

To determine the economic sectors for the suggested "roll out" we establish choose two main economic indicators that are Gross Domestic Product and Employment. The following table is the weight of the correlation of the indicators. This is the first parameter to choose which sectors we are suggesting opening. Table 4 shows the impact of each sector in terms of quantity of employment and GDP on the economy.

	Employment		GDP		Economic
	Thd. Persons	%	Mill $	%	Weight
Mining, logging and construction	26.6	3.01%	888.8	0.88%	1.99%
Manufacturing	75.2	8.50%	47,834.8	47.45%	24.56%
Trade, transportation and utilities	175.3	19.81%	11,086.6	11.00%	18.06%
Information	16.4	1.85%	2,757.8	2.74%	2.75%
Financial Activities	44.9	5.07%	20,578.0	20.41%	12.45%
Professional and Business Services	122.4	13.83%	4,292.3	4.26%	9.39%
Education and Health Services	121.8	13.76%	4,341.1	4.31%	9.42%
Leisure and hospitality	81.5	9.21%	2,192.4	2.17%	5.47%
Other services	18.3	2.07%	407.0	0.40%	1.12%
Government	202.5	22.88%	6,438.6	6.39%	14.79%
TOTAL	884.9	100.00%	100,817.4	100.00%	100.00%

Table 1: Economic indicator weight matrix table (Source: Department of Labor)

The table above indicates that Manufacturing and Trade, transportation and utility have the highest percentage economic weight of the economic sectors analyzed. In terms of Gross Domestic Product, the manufacturing sector is the highest with a score of 47.45% followed by financial Activities sector with a score of 20.41%. In terms of employment the highest percentage goes to Government with 22.8% and on the private sector goes to the Trade, transportation and utilities sector with 19.81%.

To complement the Key Economic Indicators, discuss above, we are correlating it to a risk analysis based on the following Key Performance Indicators (KPI).

Economic Activity Sectors of the Economy of Puerto Rico. Sectors listed by Risk Magnitude of COVID-19	
Economic Sectors	Relative Risk Index
Construction	1.3
Mining	3.0
Information	3.0
Manufacturing	6.2
Agriculture	7.9
Other Services	9.6
Real State and Rent	12.5
Wholesale Trade	14.3
Finance and Insurance	18.6
Art, Entertainment and Recreation	22.7
Government	27.4
Transportation, Utilities and Storage	34.3
Professional Services, commercial and Tech	42.1
Retail	50.8
Accommodation and Restaurants	50.9
Health and Social services	270.4
Educational Services	272.6

Table 2: Risk Factor index (Analysis done by Dr. Heriberto A. Marín Centeno, Public Health Graduate School, RCM, UPR)

The Risk Factor Analysis indicates that the higher the relative index is, the greater the risk of Covid-19 contagion and fatalities for employee in that specific sector of economic activity. Based on this index, the sector with lower risk is Construction with 1.3, followed by Mining with 3.0, is important to notice that Manufacturing comes in fourth place with 6.2. *(Refer to table 4 of the annexes for detail KPI's of the Risk Factor Index and Methodology).*

c) Covid-19 workforce basic reproduction rate index

After two incubation windows with approximately one hundred thousand active employees on different sectors, we have a representative sample of the universe of our population. This index will measure how many people physically active in their respective sectors are positive or are being exposed to positive cases, also we would measure how companies are implemented containment measure. The main goal is to measure have a parallel index that complement the Department of Health statics and indexes to measure the basic reproduction rate. This rate will support the efforts of the "roll out" of the private sector as well as help in the short- and long-term containment strategies of the Department of Health. This tool will give visibility to companies and government officials in order to take inform decisions.

Format:

The index will be constructed as a passive-active hybrid model between the Private sector and the BEOC.

Some of the control Variables:

1. Active sector
2. Business Type
3. Region
4. Number of active employees.
5. Employees in quarantine.
6. Positive Covid-19 cases.
7. Negative Covid-19 cases.

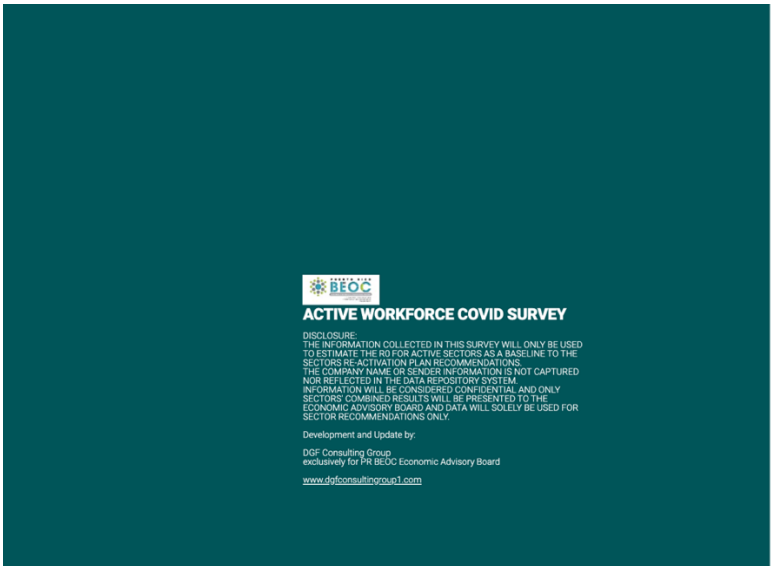

Figure 8: Covid-19 Survey.

Mechanism

- The template will use the previously mentioned variables. They will be ratified by the Private sector.
- This template will be used only by active businesses.
- This information will be accounted by and entered into the corresponding monitoring system.

- The administrators of the index will carry out active random interventions, calling different active businesses corroborate that they filled the template on the corresponding day.

Data Collected

- Economic Sector.
- Municipality.
- Active Workforce.
- Total Workforce.
- Employees Covid-19 Positives.
- Employees under Quarantine.
- Risk conditions.
- NPI's Measures.
- Period.

Objectives:

• Support the island Covid-19 data systems implemented by the Department of Health.
• Have an index by private sectors in order to take quick corrective actions.
• Measure by sector the implementation of the Working Standard Guidelines in the Covid-19 pandemic.
• Segment by region, sector and company, if there is any Covid-19 outbreak without affecting the rest of the population.
• Focus correction efforts by identifying "Hot Spots"
• Agile contact tracing mechanism with daily reports and follow-up calls.
• Basic reproduction number of infected people of this active population, R0 of the labor sector

Results:

These results are from April 15 to April 23

Quantity of Companies	263
Active Employees*	63,354
Positive Covid – 19 Cases	25
Percentage of Covid -19 Cases	0.039%
Estimate of Covid-19 positive cases based on the survey**	1,209

Table 3: Workforce reproduction Index survey results.

*For the purpose of this survey, active employees are the ones who are physically active on their respective workspace. Employees working remotely are not consider on this survey.

**This assumes an active workforce between the ages of 20 to 69 years. (3,100,000*0.039%=1,209).

Department of Health Data as of April 23, 2020:

Positive Patients	1416
Positive less than 19 years	76
Positive over 70 years	166
Undetermined age	49
Positive between 20 and 69	1174
Estimated total population	3,100,000

Table 4: Department of Health Covid-19 data.

Main differences between the results of the survey and the results of the Department of Health data:

- Difference between the survey and the Department of Health data: 1,209-1,174=35 (3%).
- Department of Health includes 49 cases of undetermined age.

Assuming the same distribution of cases by age as reported by the Department of Health, 85% of those cases of undetermined age will fall in the 20 to 69 years of age range for a total of 42 cases. The difference will then be 1,209- (1,174+42) = -7 that is 0.57% error from the active workforce sample to the Department of Health Results.

AGRICULTURE	60
CHEMICALS - PHARMA/ BIOPHARMA	1325
COMMERCIAL	2377
COMMUNICATION	1283
ENERGY	691
FINANCIAL SERVICES	6693
FOOD	32005
HEALTH	3896
INFRASTRUCTURE	754
MANUFACTURING	1277
MEDIA	9
MEDICAL DEVICES	7474
NGO	2
OTHER SERVICES	336
SECURITY	4956
TOURISM	30
TRANSPORTATION	186

Figure 9: Economic Sectors.

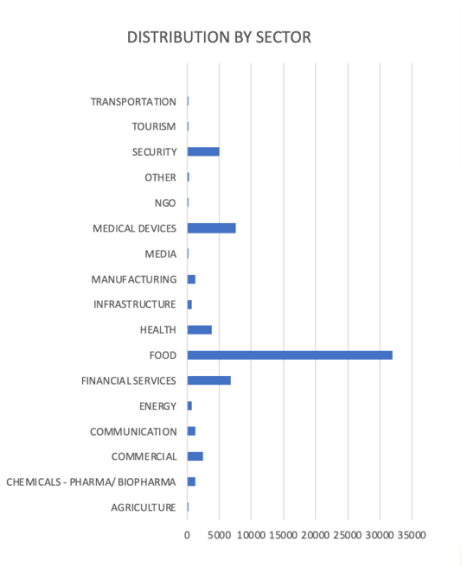

Figure 10: Distribution by Sector.

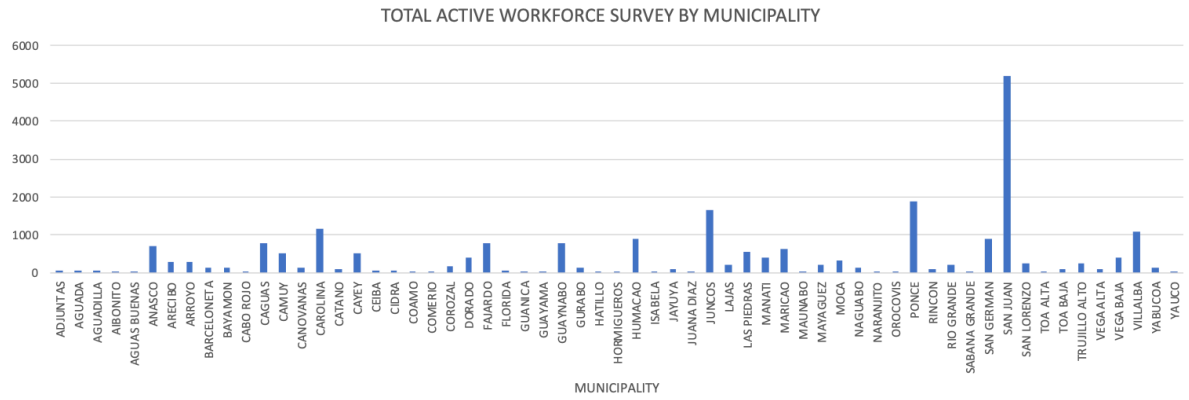

Figure 11: Total Active Workforce by municipality.

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
ADJUNTAS	55	0
AGUADA	46	0
AGUADILLA	67	0
AIBONITO	31	0
AGUAS BUENAS	26	0
ANASCO	721	0
ARECIBO	298	0
ARROYO	300	0
BARCELONETA	141	0
BAYAMON	145	0
CABO ROJO	30	0
CAGUAS	780	0
CAMUY	514	0
CANOVANAS	139	0
CAROLINA	1145	1
CATANO	99	0
CAYEY	512	0
CEIBA	45	0
CIDRA	54	0
COAMO	36	0
COMERIO	27	0

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
COROZAL	172	0
DORADO	402	0
FAJARDO	777	0
FLORIDA	60	0
GUANICA	11	0
GUAYAMA	2	0
GUAYNABO	792	1
GURABO	126	0
HATILLO	2	0
HORMIGUEROS	4	0
HUMACAO	885	1
ISABELA	3	0
JAYUYA	104	0
JUANA DIAZ	30	1
JUNCOS	1650	1
LAJAS	215	0
LAS PIEDRAS	574	0
MANATI	401	0
MARICAO	650	0
MAUNABO	13	0
MAYAGUEZ	213	0

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
MOCA	310	0
NAGUABO	152	0
NARANJITO	12	0
OROCOVIS	9	0
PONCE	1878	0
RINCON	106	0
RIO GRANDE	225	0
SABANA GRANDE	2	0
SAN GERMAN	902	1
SAN JUAN	5182	7
SAN LORENZO	237	0
TOA ALTA	9	0
TOA BAJA	111	0
TRUJILLO ALTO	252	0
VEGA ALTA	98	0
VEGA BAJA	403	1
VILLALBA	1097	0
YABUCOA	139	0
YAUCO	27	0

>1 MUNICIPALITY	18448	4
ISLANWIDE OPERATIONS	21457	8

Figure 12: Active Employees by municipality.

Periodicity of the survey:

The survey should be done at least every Monday and Friday to gather the necessary data, till Health Authorities determine that we are out of any immediate danger of Covid-19 cases.

d) Risk Assessment Tool: Operational Plan

Company XX completed an assessment considering the elements included in the Risk Assessment Tool. This plan describes the non- pharmaceutical intervention measures adopted by COMPANY XX, to mitigate the risks identified as a result of the risk assessment process.

Specifics:

A. Non-Pharmaceutical Interventions (NPI) Measures : Describe mitigations implemented for each exposure risk.
    1. Employee Exposure Risk
    2. Geographical Exposure Risk
    3. Age Bracket Risk
    4. Health Conditions Risk
    5. Workspace Exposure Risk
    a. Facility Occupancy level
    b. Use of Common Areas
    c. Heat Ventilation and Air Conditioning (HVAC) Units
    d. Personal Hygiene
    6. Client Exposure Risk
B. Administrative Controls
C. Behavioral and Social Distancing Controls
D. Essential Functions Assessment

    1. Identify your critical operations and if needed adjust your business continuity plans to maintain critical operations
    2. Identify alternate supply chains for critical goods and services.
    3. If using temporary work force or professional services support establish requirements to your provider to report their plans and measures.

Enforcement Mechanism

Describe how the Company intends to enforce compliance with the non-pharmaceutical intervention measures.

Incident Management plan

Each Company must describe the protocol that will be followed in the event of a confirmation of an active employee as a positive COVID-19.

1. Company's communication plan to employees.
2. Quarantine protocol
3. Cleaning protocol
4. Communication to PR Health Authorities

Succession PLAN

Company X has determined the following leaders as responsible for the implementation and execution of this plan. List authorized leaders identified in the succession plan.

e) Economic Rollout Phases and Timeline

One of the main goals of this "roll out" is focus on the labor force that have to be physically active in their workplace, this roll out does not emphasize in employees working digitally, nevertheless it does not discard them. Understanding the Economic Weight of the different sectors and the Risk Factor Index, the Economic Taskforce suggest opening the following sectors at the following phases:

Phase	Sector	Sub-Sector	Economic Weight (%) Table 4/NAIC	Risk Index	Number of employees (Thousand)	GDP impact (Million) Table 4/NAIC
One	Manufacturing	X	24.56	6.2	38.1	$47,834.8
One	Manufacturing	Chemical	21.05	6.2	16.1	$10,045.1
One	Manufacturing	Miscellaneous	25.66	6.2	11.1	$11,958.5
One	Manufacturing	Apparel	6.21	6.2	7.8	$2,870.0
One	Manufacturing	Food	5.59	6.2	11.7	$2,678.7
One	Manufacturing	Computer and Electronic	4.87	6.2	5.75	$2,248.2
One	Manufacturing	Electrical Equipment, Appliance and Components	4.43	6.2	3.6	$2,056.9
One	Manufacturing	Fabricated Metal Products	3.47	6.2	3.8	$1,674.2
One	Manufacturing	Beverage and Tobacco Manufacturing	2.02	6.2	2.2	$1,052.3
One	Manufacturing	Plastic and Rubber Products/Transportation Equipment/Others	2.77	6.2	20.45	$13,250.9
One	Construction	Construction	1.99	1.3	28.8	$888.8
One	Construction	Heavy and Civil Engineering Construction	-	1.3	3.05	$532.8
One	Construction	Mining and Logging	-	1.3	0.55	-
	Construction	General	-	1.3	25.2	-
One	Health Services	-	6.1	270.4	72.85	-

One	Health Services	Hospitals	-	270.4	38.1	-
One	Health Services	Ambulatory Health Service	-	270.4	29.7	-

Table 5: Economic Rollout Table. The above table is part of data provided by PRIDCO under NAIC, this data was analyzed and segmented, see excel documents provided. [10]

The Roll Out will be divided in four phases, starting on May 4, 2020 till July 20,2020. Table 5 describe Phase one of the "Roll Out", it will be comprised mainly of the Manufacturing, Construction and Health Sector (See table 6). This sectors where chosen out of a combination of the economic impact of each sector and their corresponding risk factors. Manufacturing shows to have the highest weight of the sectors (see table 1) and also it has one of the lowest risk factors with a score of 6.2 (see table 2). Construction has one of the lowest weights based on economic impact (see table 1) but it has the highest score in the risk factor analysis with 1.3 (see table 2).

The Economic Task Force also suggest that there's an activation of the healthcare system, specifically Hospitals. This sector has idle capacity and are being forced to lay off employees, also they are facing massive economic losses that could force them to close or to be bail by the government as an alternative. This suggestion is condition to the following: The Department of Health should prepare a Hospital to attend Covid-19 patients, we suggest the state Hospital of Bayamon as the hub to manage the pandemic. The other condition is that hospital got to have contingencies plans to make a roll-back to help in the mitigation of Covid-19 if needed. This recommendation has to be validated with the Department of Health.

[10] Table 3 data is a combination of data of the Bureau of Labor and a PRIDCO dataset, a sheet in which the data extraction is worked with VLOOKUP, and a sheet of all NAICS2017 codes for the VLOOKUP function to make reference to. This file is the source of the first estimate sheet and contains the original functions used for data extraction such that they can be verified. The VLOOKUP sheet is setup the following way:

- Col. A: G are a copy/paste of the original table with "values only" (i.e.: no table formatting) such that VLOOKUP can be used.
- Col., I use VLOOKUP to extract NAICS3 labels. The function looks for the appropriate value on Col. F on the 2017_NAICS_Descriptions sheet and extracts the title on them.
- Col. J and K use an advanced filter (based on col. F and I, respectively) with the unique optioned ticked on.
- Col. L and N sum "sumnominaprop" and "empleos", by matching against NAICS3 codes (i.e.: by sub-sector sum)
- Col. M and O provide percentages
- *NAICS3 descriptions were extracted the exact same way as the labels, but the source formula is not provided in this worksheet*

The first estimate sheet contains the extracted values from the previous PRIDCO file.

- All NAICS3 codes and their corresponding labels and descriptions.
- Aggregates of "empleos" and "suma nomina prop" by sub-sector.
- Three simple transformations of the data: percentages of "sum nomina prop", percentages of "empleos", and "sum nomina prop" per "empelo"
- Whether the data is in terms of thousands or not has not be checked with PRIDCO.

10

Phase one will impact the GDP in approximately $46,067.30 Million dollars. Each company of the sectors and subsectors liberalized must comply with the Private Sector Reactivation Guidelines and Self-Certification mechanism.

The economic taskforce also suggests for phase one the following:

a. Full Supply Chain of the sectors being activated should open.
b. Normalize all business that are on a limited schedule to the full quarantine operational framework and schedule.

The reactivation took into consideration active essential sectors that are active and the ones that are not active, also economic sectors that are non-essential that are active and the ones non active. The suggested "roll out" is of both sectors and subsectors classified as essential and nonessential. (See table 7).

Sector	Sub-Sector
Manufacturing	X
Manufacturing	Chemical
Manufacturing	Miscellaneous
Manufacturing	Apparel
Manufacturing	Food
Manufacturing	Computer and Electronic
Manufacturing	Electrical Equipment, Appliance and Components
Manufacturing	Fabricated Metal Products
Manufacturing	Beverage and Tobacco Manufacturing
Manufacturing	Plastic and Rubber Products/Transportation Equipment/Others
Construction	Construction
Construction	Heavy and Civil Engineering Construction
Construction	Mining and Logging
Construction	General
Health Services	-
Health Services	Hospitals
Health Services	Ambulatory Health Service

Table 6: Suggested economic sectors and sub-sectors.

Industry Sub-Sector	# Empl ('000)	Industry	Essential (Y/N)
Merchant Wholesalers, Nondurable Goods	17.7	Trade - Wholesale	Non Essential
Merchant Wholesalers, Durable Goods	12.1	Trade - Wholesale	Non Essential
General Merchandise Stores	23.7	Trade - Retail	Non Essential
Clothing and Clothing Accessories Stores	16.4	Trade - Retail	Non Essential
Motor Vehicle and Parts Dealers	12.9	Trade - Retail	Non Essential
Building Material and Garden Equipment and Supplies Dealers	9.6	Trade - Retail	Non Essential
Furniture and Home Furnishings Stores	2.4	Trade - Retail	Non Essential
Administrative and Support and Waste Management and Remediation Services	73.8	Prof & Bus Serv	Non Essential
Miscellaneous durable goods manufacturing	11.1	Manufacturing	Non Essential
Apparel Manufacturing	7.8	Manufacturing	Non Essential
Computer and Electronic Product Manufacturing	5.8	Manufacturing	Non Essential
Fabricated Metal Product Manufacturing	3.8	Manufacturing	Non Essential
Electrical Equipment, Appliance, and Component Manufacturing	3.6	Manufacturing	Non Essential
Beverage and Tobacco Product Manufacturing	2.2	Manufacturing	Non Essential
Food Services and Drinking Places	65.4	Leisure and Hospitality	Non Essential
Other Hospitality Services	18.0	Leisure and Hospitality	Non Essential
Accommodation	12.0	Leisure and Hospitality	Non Essential
Publishing Industries (except Internet)	2.2	Information	Non Essential
Educational Services	34.7	Health & Educ Services	Non Essential
Colleges, Universities, and Professional Schools	15.8	Health & Educ Services	Non Essential
Elementary and Secondary Schools	12.5	Health & Educ Services	Non Essential
State Government Excluding Education	77.7	Government	Non Essential
State Government Educational Services	56.9	Government	Non Essential
Insurance Carriers and Related Activities	16.2	Finance Serv	Non Essential
Real Estate and Rental and Leasing	14.5	Finance Serv	Non Essential
Construction	25.2	Construction	Non Essential
Heavy and Civil Engineering Construction	3.1	Construction	Non Essential
Mining and Logging	0.6	Construction	Non Essential
Transportation and Warehousing	18.3	Transp & Whse	Essential
Food and Beverage Stores	27.3	Trade - Retail	Essential
Health and Personal Care Stores	18.8	Trade - Retail	Essential
Professional, Scientific, and Technical Services	34.2	Prof & Bus Serv	Essential
Medical Devices	20.0	Manufacturing	Essential
Chemical Manufacturing	16.1	Manufacturing	Essential
Food Manufacturing	11.7	Manufacturing	Essential
Information	16.4	Information	Essential
Ambulatory Health Care Services	38.1	Health & Social Services	Essential
Hospitals	29.7	Health & Social Services	Essential
Individual and Family Services	5.1	Health & Social Services	Essential
Local Government	50.6	Government	Essential
Federal Government	16.8	Government	Essential
Credit Intermediation and Related Activities including Monetary Authorities	12.2	Finance Serv	Essential
	872.1		

Table 7: Industry Sub Sector active employees' matrix (Source: Bureau of Labor Statistics (2020). CES.

Based on the data provided by the Bureau of Labor Statics of 2020, the total labor force is of 872.1 thousand (See table 7). The total combined employees of the suggested sectors for Phase one of the "Roll Out" are 183.7 thousand. This data does not show the percentage of the active employees working already and of those active the ones working remotely. This plan encourages that employees working remotely should stay working on that format, till health authorities stipulate that Covid-19 doesn't represent a threat.

VII. Next steps

a) Population Immunity

Given that the conditions are met to enter this stage, Puerto Rico should be able to treat cases early on and provide preventive therapeutic care such as to minimize the share of cases that end up in critical condition. Most importantly, the territory must progressively build population-level immunity through vaccination such

that distancing measures can finally be relaxed without much likelihood of the reemergence of high infection rates.

Puerto Rico will have to work closely with the CDC and vaccine developers to plan the execution of mass vaccination for the population. The vaccination campaign, especially if supply is limited, should prioritize those who are most vulnerable due to age or preexisting conditions, along with healthcare and front-line workers. An essential component of this collaboration with the CDC is that the serological testing system remains active such that the territory can identify the share of its population that is immune (be it from vaccines or natural recovery) and, therefore, determine a proper date for lifting remaining social and physical restrictions.

b) Compliance: Google Mobility Reports

Some private persons and businesses have violated the temporary regulations imposed to fight the pandemic, and have been faced with either fines, jail time, or closures of establishments. This is to be expected in any territory of such size attempting to undertake a much needed yet quite restrictive shutdown policy. Public health officials seeking access to any and all tools that help them promote or measure social distancing have called on Google to collaborate with them. In turn, the entity utilized its aggregated anonymized data to publish by-country COVID-19 Community Mobility Reports. These are useful for tracking activity trends across time and economic sectors; the stated goal in publishing them is to "help health officials understand responses to social distancing guidance" [16].

Figures 7 & 8 show the reports for Puerto Rico and the US as a whole, respectively. They make clear that, based on Google's location data, the territory was significantly harsher and quicker in it shutting down of all economic sectors, whilst also experiencing a higher positive rate of mobility change towards residences. The data suggest that persons in the territory followed quarantine and social distancing measures more seriously, and earlier, that the average US inhabitant. This data is promising as it suggests above-average compliance by inhabitants of the territory when compared to those of the overall US.

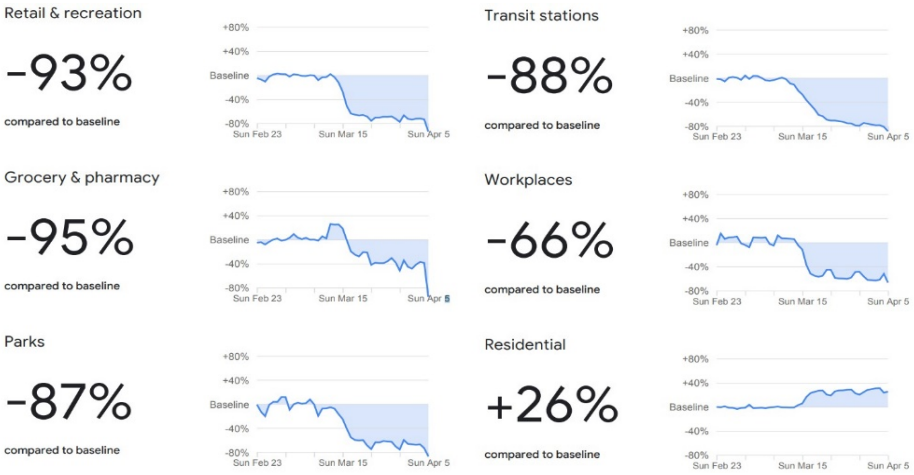

Figure 13: PR Google Mobility Reports

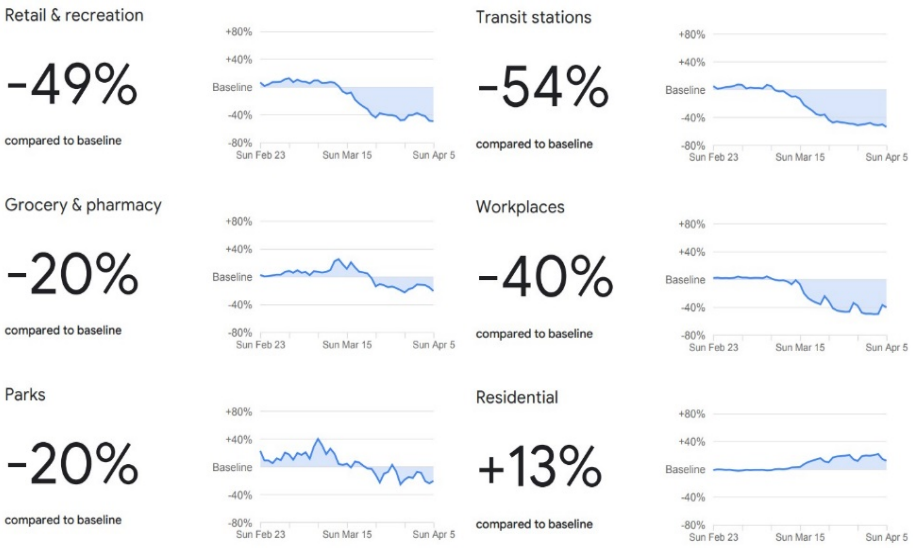

Figure 14: US Google Mobility Reports

These reports are based on location data and should thus be analyzed with a keen eye for caveats. Socioeconomic dynamics might introduce selection bias and skew the data such that it is incredibly misleading. This is because only individuals with smartphones and enabled location tracking are tracked in these reports. Workers in the frontlines, for example, will naturally be exempt from some distancing regulations. As such, these workers are less likely to reflect 'compliance' to social distancing.

These sorts of issues are always plausible with data; given the pandemic's novelty and severity, and the fact that the territory is lacking in information structure, it should welcome data and refer to all reliable data sources, especially those with aggregation, in the process of assessing the situation and planning a recovery. Just like the recovery process is gradual and flexible, so should the levels of confidence, trust, and reliance on specific data sources be adaptable to changes in information and/or new revelations.

c) Preparing for the Next Crisis

Puerto Rico was successful in imposing a shutdown relatively early compared to states in the US. Still, the pandemic made undeniable some shortcomings in the island's healthcare system that must be addressed. Clearly shutdowns cannot be a long-term tool for fighting diseases of this nature. It is almost certain that epidemics and pandemics will continue to emerge in the future, and it is possible that some could not be controlled by that approach. It is thus wise for the territory to establish a recovery and development plan for its healthcare system such that it is prepared for the next crisis of this nature. The territory will need to collaborate with federal entities to prepare its hospitals such that they can accommodate large surges of patients. This will require addressing supply chains of equipment (ex: masks, gloves, clothing, ventilators, medicines, and beds) as well as staffing and spatial concerns. The healthcare system is, of course, not limited

to hospitals. The development of programs that address issues such as identifying high-risk populations and ensuring they receive proper care, building capacity for early detection of all diseases, and making therapeutics and preventive care widely accessible, are as important as the aforementioned changes to hospitals.

d) Incubation Period Chosen for the economic "roll out" and why

This schedule is specific and divided in phases of fourteen days. The analysis took into consideration that we are at day forty-one (41) of the quarantine. The Economic Task Force choose the "roll up" phases to correlate the incubation time of the virus. We did an extensive secondary data study and our findings indicate that the vast majority of the medical and scientific community confirm that fourteen days is a very fair estimate of the incubation time of Covid-19. To complement this, we are attaching some of our sources, they are as follows:

1. World Health Organization (WHO)

The time between exposure to COVID-19 and the moment when symptoms start is commonly around five to six days but can range from 1 – 14 days.

Source: https://www.who.int/news-room/q-a-detail/q-a-coronaviruses (April 17, 2020)

2. Center for Disease Control (CDC)

The onset and duration of viral shedding and the period of infectiousness for COVID-19 are not yet known. It is possible that SARS-CoV-2 RNA may be detectable in the upper or lower respiratory tract for weeks after illness onset, similar to infections with MERS-CoV and SARS-CoV. However, detection of viral RNA does not necessarily mean that infectious virus is present. There are reports of asymptomatic infections (detection of virus with no development of symptoms) and pre-symptomatic infections (detection of virus prior to development of symptoms) with SARS-CoV-2, but their role in transmission is not yet known. Based on existing literature, the incubation period (the time from exposure to development of symptoms) of SARS-CoV-2 and other coronaviruses (e.g. MERS-CoV, SARS-CoV) ranges from 2–14 days.

Source: https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html (April 16,2020)

3. National Center for Biotechnology Information (NCBI)

a. Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20–28 January 2020

Jantien A Backer, [1] Don Klinkenberg, [1] and Jacco Wallinga [1,2]

Abstract:

A novel coronavirus (2019-nCoV) is causing an outbreak of viral pneumonia that started in Wuhan, China. Using the travel history and symptom onset of 88 confirmed cases that were detected outside Wuhan in the early outbreak phase, we estimate the mean incubation period to be 6.4 days (95% credible interval: 5.6–7.7), ranging from 2.1 to 11.1 days (2.5th to 97.5th percentile). These values should help inform 2019-nCoV case definitions and appropriate quarantine durations.

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7014672/

b. **Incubation Period Duration and Severity of Clinical Disease Following Severe Acute Respiratory Syndrome Coronavirus Infection.** Victor Virlogeux,[1,2] Vicky J. Fang,[2] Joseph T. Wu,[2] Lai-Ming Ho,[2] J. S. Malik Peiris,[2,3] Gabriel M. Leung,[2] and Benjamin J. Cowling[2]

The incubation period is thought to be a function of the initial infective dose, the speed of replication of the pathogen within the host, and within-host defense mechanisms.[1]

Parametric and nonparametric estimates of the incubation period distribution are presented in Figure 1A and show close agreement. We found a shorter incubation period for the fatal cases with a mean of 3.7 days (95% credibility interval, CrI: 2.6, 5.8), compared with a mean of 4.8 days (95% CrI: 4.2, 5.5) for the non-fatal cases, and a difference in means of 1.02 days (95% CrI: −0.41, 2.22) which was not significant.

The epidemic curve in the Amoy Gardens outbreak followed a very similar pattern, consistent with an infection event on 21st March 2003 (Figure 1B). Incubation periods for each patient were calculated based on this infection date. In this group, the mean incubation period was significantly shorter in the fatal cases 4.5 days (95% CrI: 3.8, 5.6) than in the non-fatal cases 5.5 days (95% CrI: 5.2, 6.0) with mean difference 1.06 days (95% CrI: 0.16, 1.97) which was significant.

In the multivariable logistic regression model, we found that a shorter incubation period was generally associated with an increased risk of death in both subsets of patients. This association was statistically significant in the analysis of the patients with exposure intervals (OR=0.86; 95% CrI: 0.71, 1.00), and in the Amoy Gardens cluster with an OR=0.79 (95% CrI: 0.67, 0.94) (see also eAppendix).

Source: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4889459/

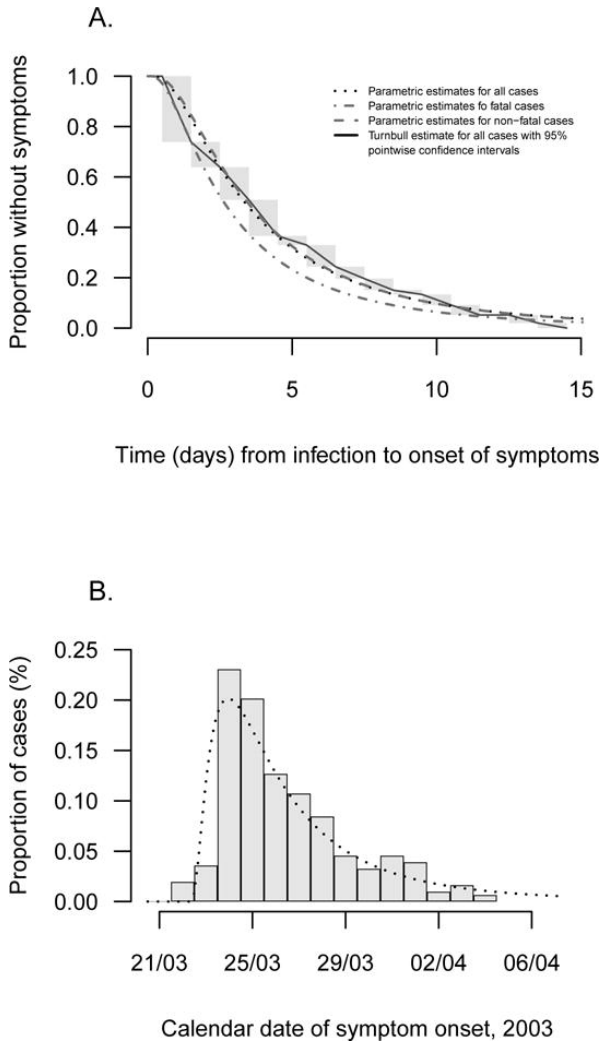

Figure 15: Incubation Period curves.

5. Annals of Internal Medicine (ACP)

The Incubation Period of Coronavirus Disease 2019 (COVID-19) From Publicly Reported Confirmed Cases: Estimation and Application. *Stephen A. Lauer, MS, PhD *; Kyra H. Grantz, BA *; Qifang Bi, MHS; Forrest K. Jones, MPH; Qulu Zheng, MHS; Hannah R. Meredith, PhD; Andrew S. Azman, PhD; Nicholas G. Reich, PhD; Justin Lessler, PhD*

There were 181 confirmed cases with identifiable exposure and symptom onset windows to estimate the incubation period of COVID-19. The median incubation period was estimated to be 5.1 days (95% CI, 4.5 to 5.8 days), and 97.5% of those who develop symptoms will do so within 11.5 days (CI, 8.2 to 15.6 days) of infection. These estimates imply that, under conservative assumptions, 101 out of every 10 000 cases (99th percentile, 482) will develop symptoms after 14 days of active monitoring or quarantine.

Conclusion:

This work provides additional evidence for a median incubation period for COVID-19 of approximately 5 days, similar to SARS.

Source:https://annals.org/aim/fullarticle/2762808/incubation-period-coronavirus-disease-2019-covid-19-from-publicly-reported

6. The New England Journal of Medicine (NEJM)

COVID-19 Incubation Period: An Update. March 13, 2020 *Stephen G. Baum, MD reviewing Lauer SA et al. Ann Intern Med 2020 Mar 10*

In the resulting models, estimated median incubation time (IT) of COVID-19 was 5.1 days; mean IT was 5.5 days. For 97.5% of infected persons, symptoms appear by 11.5 days. Fewer than 2.5% are symptomatic within 2.2 days. Estimated median IT to fever was 5.7 days. Among 108 patients diagnosed outside mainland China, median IT was 5.5 days; the 73 patients diagnosed inside China had a median IT of 4.8 days. Using exposures designated as high risk and a 7-day monitoring period, the estimate for missed cases was 21.2 per 10,000. After 14 days, the estimated number of missed high-risk cases was 1 per 10,000 patients.

Source: https://www.jwatch.org/na51083/2020/03/13/covid-19-incubation-period-update

7. Research Gate

Does SARS-CoV-2 has a longer incubation period than SARS and MERS?

The outbreak of a novel coronavirus (SARS-CoV-2) since December 2019 in Wuhan, the major transportation hub in central China, became an emergency of major international concern. While several etiological studies have begun to reveal the specific biological features of this virus, the epidemic characteristics need to be elucidated. Notably, a long incubation time was reported to be associated with SARS-CoV-2 infection, leading to adjustments in screening and control policies. To avoid the risk of virus spread, all potentially exposed subjects are required to be isolated for 14 days, which is the longest predicted incubation time. However, based on our analysis of a larger dataset available so far, we find there is no observable difference between the incubation time for SARS-CoV-2, severe acute respiratory syndrome coronavirus (SARS-CoV), and middle east respiratory syndrome coronavirus (MERS-CoV), highlighting the need for larger and well-annotated datasets. Highlights • It is unclear whether there are statistically significant differences in incubation times amongst SARS-CoV-2, SARS-CoV and MERS-CoV. However, this is because: 1) Limited available data challenges investigation of the current coronavirus outbreak. 2) Lack of annotation also makes it difficult to i

Source:https://www.researchgate.net/publication/339256238_Does_SARS-CoV-2_has_a_longer_incubation_period_than_SARS_and_MERS

8. International Journal of Infectious Diseases

The SARS-CoV-2 outbreak: What we know. **Volume 94, May 2020, Pages 44-48**

Di Wu[1], Tiantian Wu[2], Qun Liu[1], Zhicong Yang[1,*] [1] Guangzhou Center for Disease Control and Prevention, Guangzhou, China [2] Zhongshan School of Medicine, Sun Yat-sen University, Guangzhou, China

Incubation period

In recent publications, the mean incubation period of CoVID-19 was a little bit different. Wang et al., with 138 cases, reported that the median durations from first symptoms to dyspnea, hospital admission, and acute severe respiratory syndrome (ARDS) were 5 days (range, 1–10), 7 days (range, 4–8), and 8 days (range, 6–12), respectively (Wang et al., 2019). Li et al., with 425 confirmed cases, instructed that the mean incubation period was 5.2 days (95% confidence interval [CI], 4.1–7.0), with the 95th percentile of the distribution at 12.5 days. In its early stages, the epidemic doubled in size every 7.4 days. With a mean serial interval of 7.5 days (95% CI, 5.3–19), the basic reproductive number was estimated to be 2.2 (95% CI, 1.4–3.9) (Li et al., 2020a). While Guan et al. (2019), with 1099 patients, reported that the estimated mean incubation period of SARS-CoV-2 infection was 3.0 days (range, 0–24.0), which was shorter than in the two research reports above (3.0 days vs 5 days and 5.2 days). The median incubation period of CoVID-19 ARD was 3.0 days and it had a relatively lower fatality rate than SARS and MERS (Wang et al., 2019), while the estimated mean incubation period of SARS-CoV infection was 4.6 days (95% CI, 3.8–5.8 days) (Chiu et al., 2003) and 95% of illness onset occurred within 10 days (DC et al., 2003). The mean time from symptom onset to hospitalization was between 2 and 8 days, but was shorter toward the later phase of the epidemic. The mean time from symptom onset to need for invasive mechanical ventilation (IMV) and to death was 11 and 23.7 days, respectively (Leung et al., 2020).

Source: https://www.sciencedirect.com/science/article/pii/S1201971220301235#bib0195

https://doi.org/10.1016/j.ijid.2020.03.004

e) Suggested Economic Task Force Schedule: Milestones Table

Milestone	Due Date	Who's Responsible	Details
Full "Roll Out" of Chemical Manufacturing Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Miscellaneous Manufacturing Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Apparel Manufacturing Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Food Manufacturing Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Computer and Electronic Manufacturing Sec	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
"Roll Out" Electrical Equipment, Appliance and Components.	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Fabricated Metal products Manufacturing S	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.

Full "Roll Out" of Beverage and Tobacco Manufacturing.	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Plastic and Rubber Products / Transportatio	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Construction Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Heavy and Civil Engineering Construction.	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Mining and Logging	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation
Full "Roll Out" of General Construction	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Hospitals of Health Services Sector	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Full "Roll Out" of Ambulatory Health Services	May 04, 2020	Governor of Puerto Rico	The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.

Normalize all business that are on a limited schedule.	May 04, 2020	Governor of Puerto Rico	Normalize all business that are on a limited schedule to the full quarantine operational framework and schedule. The suggestion is for a full roll out of this sector its supply chain and the public agencies that support its operation.
Covid-19 workforce basic reproduction rate index Survey	May 04, 2020	DDEC-Economic Task Force W2	Full roll out of the survey, each Monday and Friday.

f) Conclusions

The Puerto Rican economy has been received significant shocks over the past years that have worsened an already contractionary economic environment. The COVID-19 pandemic is simply the latest of these shocks. The economic task force strongly suggests for a control economic "roll out" implementing compliance systems and following the foremost indexes. The primary aim is to protect the healthcare system while protecting the economy, both systems are interconnected, and we should work to protect and manage both in an integrated manner in this new economy and way of life.

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ANNEXES:

Table 4: KPI's of the Risk Factor Index and Methodology (Analisis done by Dr.Heriberto A. Marín Centeno, Public Health Graduate School, RCM, UPR)

The COVID-19 Relative Risk Index is a preliminary attempt to capture the risk of COVID-19 contagion and fatality for employees in a sector of economic activity in a single metric. To create this index, we use the following factors or variables for each sector as inputs: total employment, distribution of employment by age group, contagion rate by age group, fatality rate by age group, average labor density by establishment, level of physical interaction between employees with clients, and number of clients whom employees directly serve. Then the index was built using the following equation:

$$IRRCOVID19_i = (IRRF_i) * (IRDL_i) * (IRIF_i) * (IRC_i)$$

Where IRRCOVID19 relative risk index for COVID-19 for economic sector i, IRRF is the relative risk of fatality index for COVID-19 for economic sector i, IRDL is the relative index of labor density for economic sector i, IRIF is the relative index of physical interaction with clients for economic sector i, and IRC is the relative index of number of clients served by employees for economic sector i. The higher the IRRCOVID19, the greater the risk that an employee in that economic sector will become infected and die from COVID-19 given the age structure of the job mania, characteristics of the work scenario, and the type of economic activity that is done.

Next, we will explain in detail how each index was built, wrapped variables, data source, and rational.

• Relative Index of Risk of Fatality by COVID19 (IRRF): This index was created with the purpose of capturing the effect that the age structure of the workforce of each economic sector activity has on the probability of contagion and the probability of death between the infected. First, the total number of persons employed by economic activity sector was obtained as reported by the Labor Statistics Bureau of the Department of Labor for January 2020. Then, the percentage of total employment corresponding to each sector of economic activity was calculated, and in the particular case of the agricultural sector, the same proportion of total employment in Puerto Rico for fiscal year 2019 was imputed using the data reported in Table 33 of *Apéndice Estadístico del Informe Económico al Gobernador del 2019.*

Second, the total number of employees for each sector of economic activity was stratified by age groups (16 to 19 years old, 20 to 24 years old, 25 to 34 years old, 35 to 44 years old, 45 to 54 years old, 55 to 64 years old, and 65 years or older). For this, the percentage distribution by age groups reported in Table 18b of the Current Population Survey (CPS) for the United States where the employed population by industry and age groups for 2019 is broken down to each economic sector in Puerto Rico.

Third, using the most up-to-date data reported by the Health Department on positive cases, the COVID-19 infection rates were calculated for every 100,000 people by age group, dividing the total number of cases by the total population in 2018, for each specific age group, and multiplying it by 100,000. These rates were then used to estimate the total number of potential COVID-19 cases for each sector of economic activity stratified by age group.

Fourth, the most recent data available on COVID-19 fatality rates by age group in Spain were used to calculate the relative risk of COVID-19 fatality for each age group using the group aged 16 to 19 years as the reference group. We use estimates from Spain for two reasons. First, Puerto Rico Department of Health is not publishing estimates of fatality by age group. And second, Spain is one of the countries with the highest number of positive cases and deaths of COVID-19 in the world, so its estimates of death rates are more mature and robust.

Fifth, for each sector of economic activity, the total number of potential cases of COVID-19 adjusted for the risk of fatality was calculated using the relative risk of fatality by age group as weight. In the following equation we show how this calculation was made:

$$TC\ Ajustado_i = (\sum RRF_j * P_j) * TC_i$$

In this equation the Adjusted TC is the total of potential cases of COVID-19 adjusted for fatality for the economic sector i, the RRF is the relative risk of fatality for each age group j, P is the proportion of the employees corresponding to the group of age j, and TC is the total of unadjusted potential cases of COVID-19 for economic sector i.

Sixth, the total of potential fatality-adjusted COVID-19 cases for all economic sectors was added together and the corresponding percent of the total for each economic sector was calculated. Finally, in order not to penalize the economic sectors with the largest number of employees, the relative mortality risk index for COVID-19 was created for economic sector i using the following equation:

$$IRRM_i = \frac{PTC\ Ajustado_i}{PET_i}$$

Where IRRM is the relative COVID-19 fatality risk ratio for economic sector i, Adjusted PTC is the percent of total potential fatality-adjusted COVID-19 cases for economic sector i, and PET is percent of the total employees of the entire economy corresponding to the economic activity sector i. If the IRRM is greater than one (1.0) it means that employees in this economic sector have a higher relative risk of getting and dying from COVID-19 given the age structure that prevails in the employment habit of that sector. If the IRRM is less than one (1.0) it means that the risk is relatively less depending on its age structure.

• Relative Labor Density Index (IRDL): This index was created to capture the potential effect that the number of employees that interact in the production process of goods and services within the establishment or workshop has on the probability of contagion of COVID-19. Using the United States County Business Pattern for 2017, we were able to obtain the data on the number of establishments and the total number of employees by industrial sector. We decided to use aggregate data for the United States instead of only for Puerto Rico, because this data represents a larger sample of establishments, the estimates are more robust and since what we are interested in is estimating a relative indicator among the economic sectors is not so important, the differences in absolute numbers.

Then, for the economic activity sector we divide the total employees by the total establishments to calculate the number of employees per establishment. The economic sector with the lowest number of employees per establishment was Real Estate and Rent, so we use it as a reference group. The last step was to divide the labor density of each economic sector by that of the Real Estate and Income sector to calculate the relative labor density index (IRDL) for each economic sector separately. The logic is that the higher the indicator, the higher the density of employees per establishment, which in theory should increase the risk of COVID-19 infection. Of course a defect that this indicator has is that it does not control for the physical area available to each worker, obviously the more physical area within the establishment the employee has, the risk of contagion is reduced.

• Relative Index of Physical Interaction (IRIF) with clients: This indicator was created with the idea of capturing, in some way, the effect on the probability of contagion that the physical distance that occurs in the interaction between the employees of a company and the customers that are served and who are the final consumers of the goods and services produced or sold. In this case, the term clients also includes service users, students within the educational setting, and patients within the health services setting. For this we create a relative index with a scale from 1 to 10 where one (1) represents an economic sector with the lowest level of physical interaction with its customers, and ten (10) represents an economic sector with the highest level of physical interaction with your customers. To assign a value to each sector of economic activity we use our subjective criteria based on our knowledge of how each sector of economic activity works. Obviously, the rational is that the higher the index, the greater the probability of contagion for employees. Being a subjective index, we recognize the possibility that the number assigned to each sector may be sensitive to different opinions, so it would be ideal if some more objective proxy variable could be found that could help us assign a value to each sector.

• Relative Index of the Number (IRC) of clients served: This indicator was created with the idea of capturing in some way the effect on the probability of contagion that may have the number of clients who are served daily and interact in person with the employees of a company. As we clarified above, in this case the term clients also includes service users, students within the educational setting, and patients within the health services setting. Again, we create a relative index on a scale of 1 to 10 where one (1) represents an economic sector with the lowest daily number of clients, and ten (10) represents an economic sector with the highest number of clients. who interact with employees in person. To assign a value to each sector of economic activity we use our subjective criteria based on our knowledge of how each sector of economic activity works. Obviously, the rational is that the higher the index, the greater the probability of contagion for employees. Again, being a

subjective index, we recognize the possibility that the number assigned to each sector may be sensitive to different opinions, so it would be ideal if some more objective proxy variable could be found that could help us assign a value to each sector.

Tabla 2-Evaluación del Riesgo por Contagio y Fatalidad de COVID-19 por Sector de Actividad Economica en Puerto Rico

Sector de Actividad Economica	% de casos positivos	% de caso positivos ajustados por nivel de riesgo de muerte	% del total de empleados	Peso relativo de acuerdo a riesgo de muerte	Indice relativo de densidad laboral	Indice relativo de interaccion fisica con clientes/usuarios/pacientes	indice relativo de cantidad de clientes a servir en contacto directo	Indice relativo de riesgo por Covid19
Agricultura	15.1%	20.9%	5.3%	3.97	1.33	1.50	1.00	**7.92**
Minería	0.0%	0.0%	0.1%	0.70	4.25	1.00	1.00	**2.96**
Construcción	2.4%	2.1%	2.8%	0.75	1.73	1.00	1.00	**1.30**
Manufactura	7.0%	6.6%	8.1%	0.82	7.63	1.00	1.00	**6.24**
Comercio al por mayor	2.8%	2.7%	3.3%	0.84	2.83	2.00	3.00	**14.27**
Comercio al detal	10.7%	9.8%	13.5%	0.73	2.79	5.00	5.00	**50.84**
Transportación, Almacenamiento y Utilidades	1.7%	1.7%	2.0%	0.84	4.07	2.00	5.00	**34.29**
Informática	1.5%	1.2%	1.8%	0.69	4.31	1.00	1.00	**2.98**
Finanzas y Seguros	4.0%	3.9%	3.2%	1.22	2.54	2.00	3.00	**18.58**
Bienes Raíces y Renta	1.4%	1.6%	1.6%	1.04	1.00	3.00	4.00	**12.52**
Servicios Profesionales, Comerciales y Tecnicos	15.1%	13.9%	13.1%	1.06	3.30	3.00	4.00	**42.13**
Servicios Educativos	3.3%	3.1%	3.8%	0.82	6.64	5.00	10.00	**272.58**
Servicios de Salud y Servicios Sociales	7.9%	7.3%	9.2%	0.79	4.27	10.00	8.00	**270.42**
Arte, Entretenimiento y Recreación	0.4%	0.3%	0.5%	0.73	3.13	2.00	5.00	**22.72**
Alojamiento y Restaurantes	5.9%	3.8%	8.3%	0.46	3.67	6.00	5.00	**50.88**
Otros Servicios	1.6%	1.7%	2.0%	0.87	1.37	2.00	4.00	**9.56**
Gobierno	19.2%	19.1%	21.7%	0.88	3.89	2.00	4.00	**27.42**
Total/ minimo de indice	**100.0%**	**100.0%**	**100.0%**					

Covid-19 workforce basic reproduction rate index

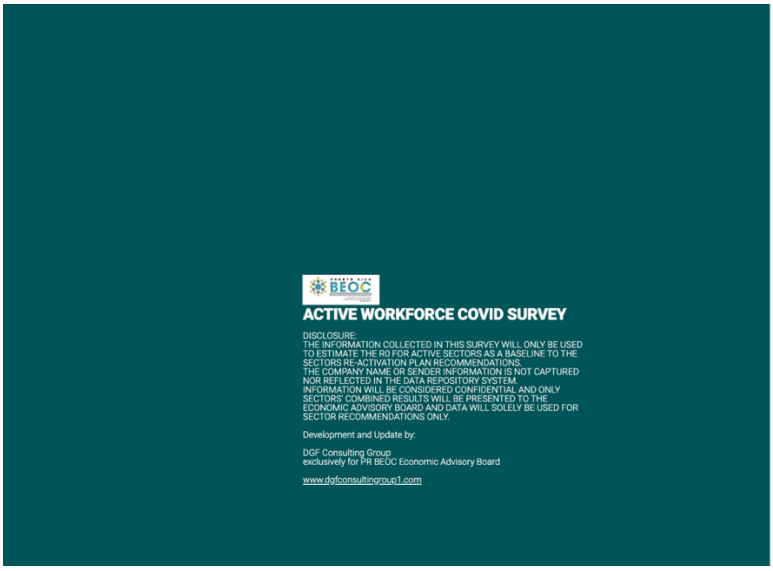
After two incubation windows with approximately one hundred thousand active employees on different sectors, we have a representative sample of the universe of our population. This index will measure how many people physically active in their respective sectors are positive or are being exposed to positive cases, also we would measure how companies are implemented containment measure. The main goal is to measure have a parallel index that complement the Department of Health statics and indexes to measure the basic reproduction rate. This rate will support the efforts of the "roll out" of the private sector as well as help in the short- and long-term containment strategies of the Department of Health. This tool will give visibility to companies and government officials in order to take inform decisions.

Format:

The index will be constructed as a passive-active hybrid model between the Private sector and the BEOC.

Some of the control Variables:

1. Active sector
2. Business Type
3. Region
4. Number of active employees.
5. Employees in quarantine.
6. Positive Covid-19 cases.
7. Negative Covid-19 cases.



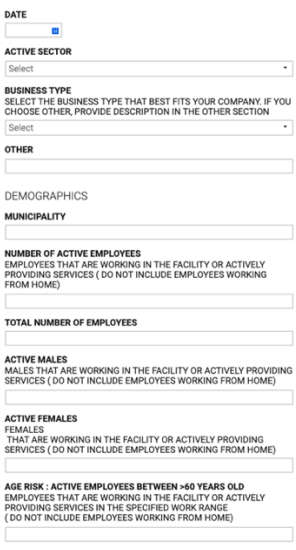


Image 1: Covid-19 Survey.

Mechanism

- The template will use the previously mentioned variables. They will be ratified by the Private sector.
- This template will be used only by active businesses.
- Active business has to provide the information on a daily basis.

- This information will be accounted by and entered into the corresponding monitoring system.
- The administrators of the index will carry out active random interventions, calling different active businesses corroborate that they filled the template on the corresponding day.

Data Collected

- Economic Sector.
- Municipality.
- Active Workforce.
- Total Workforce.
- Employees Covid-19 Positives.
- Employees under Quarantine.
- Risk conditions.
- NPI's Measures.
- Period.

Objectives:

• Support the island Covid-19 data systems implemented by the Department of Health.
• Have an index by private sectors in order to take quick corrective actions.
• Measure by sector the implementation of the Working Standard Guidelines in the Covid-19 pandemic.
• Segment by region, sector and company, if there is any Covid-19 outbreak without affecting the rest of the population.
• Focus correction efforts by identifying "Hot Spots"
• Agile contact tracing mechanism with daily reports and follow-up calls.
• Basic reproduction number of infected people of this active population, R0 of the labor sector

Results:

These results are from April 15 to April 23

Quantity of Companies	263
Active Employees*	63,354
Positive Covid – 19 Cases	25
Percentage of Covid -19 Cases	0.039%
Estimate of Covid-19 positive cases based on the survey**	1,209

Table 1: Workforce reproduction Index survey results.

*For the purpose of this survey, active employees are the ones who are physically active on their respective workspace. Employees working remotely are not consider on this survey.

**This assumes an active workforce between the ages of 20 to 69 years. (3,100,000*0.039%=1,209).

Department of Health Data as of April 23, 2020:

Positive Patients	1416
Positive less than 19 years	76
Positive over 70 years	166
Undetermined age	49
Positive between 20 and 69	1174
Estimated total population	3,100,000

Table 2: Department of Health Covid-19 data.

Main differences between the results of the survey and the results of the Department of Health data:

- Difference between the survey and the Department of Health data: 1,209-1,174=35 (3%).
- Department of Health includes 49 cases of undetermined age.

Assuming the same distribution of cases by age as reported by the Department of Health, 85% of those cases of undetermined age will fall in the 20 to 69 years of age range for a total of 42 cases. The difference will then be 1,209- (1,174+42) = -7 that is 0.57% error from the active workforce sample to the Department of Health Results.

AGRICULTURE	60
CHEMICALS - PHARMA/ BIOPHARMA	1325
COMMERCIAL	2377
COMMUNICATION	1283
ENERGY	691
FINANCIAL SERVICES	6693
FOOD	32005
HEALTH	3896
INFRASTRUCTURE	754
MANUFACTURING	1277
MEDIA	9
MEDICAL DEVICES	7474
NGO	2
OTHER SERVICES	336
SECURITY	4956
TOURISM	30
TRANSPORTATION	186

Table 3: Economic Sectors.

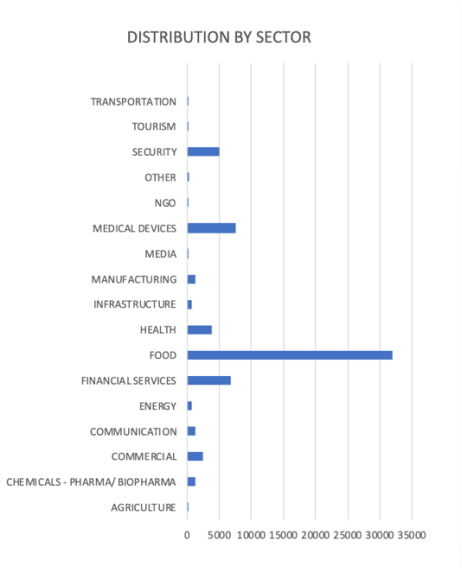


Table 4: Distribution by Sector.

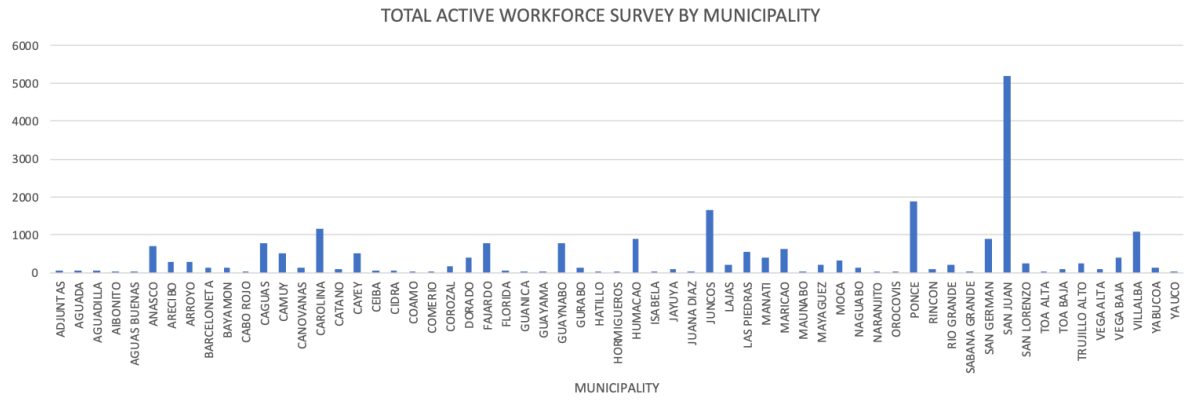


Table 5: Total Active Workforce by municipality.

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
ADJUNTAS	55	0
AGUADA	46	0
AGUADILLA	67	0
AIBONITO	31	0
AGUAS BUENAS	26	0
ANASCO	721	0
ARECIBO	298	0
ARROYO	300	0
BARCELONETA	141	0
BAYAMON	145	0
CABO ROJO	30	0
CAGUAS	780	0
CAMUY	514	0
CANOVANAS	139	0
CAROLINA	1145	1
CATANO	99	0
CAYEY	512	0
CEIBA	45	0
CIDRA	54	0
COAMO	36	0
COMERIO	27	0

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
COROZAL	172	0
DORADO	402	0
FAJARDO	777	0
FLORIDA	60	0
GUANICA	11	0
GUAYAMA	2	0
GUAYNABO	792	1
GURABO	126	0
HATILLO	2	0
HORMIGUEROS	4	0
HUMACAO	885	1
ISABELA	3	0
JAYUYA	104	0
JUANA DIAZ	30	1
JUNCOS	1650	1
LAJAS	215	0
LAS PIEDRAS	574	0
MANATI	401	0
MARICAO	650	0
MAUNABO	13	0
MAYAGUEZ	213	0

MUNICIPALITY	TOTAL WORKFORCE	COVID POSITIVE
MOCA	310	0
NAGUABO	152	0
NARANJITO	12	0
OROCOVIS	9	0
PONCE	1878	0
RINCON	106	0
RIO GRANDE	225	0
SABANA GRANDE	2	0
SAN GERMAN	902	1
SAN JUAN	5182	7
SAN LORENZO	237	0
TOA ALTA	9	0
TOA BAJA	111	0
TRUJILLO ALTO	252	0
VEGA ALTA	98	0
VEGA BAJA	403	1
VILLALBA	1097	0
YABUCOA	139	0
YAUCO	27	0

>1 MUNICIPALITY	18448	4
ISLANWIDE OPERATIONS	21457	8

Table 6: Active Employees by municipality.

Periodicity of the survey:

The survey should be done at least every Monday and Friday to gather the necessary data, till Health Authorities determine that we are out of any immediate danger of Covid-19 cases.

Health System Capacity index an Economic Perspective

I. Summary

The Health System Capacity index model is intended to measure Puerto Rico's healthcare system's operational capacity during the COVID-19 pandemic. The model uses number of total beds, number of ICU beds, and number of ventilators as its control variables.

The model functions based on a period length (30 days), an estimated starting value of cases (1000), an estimated availability of ventilators (500), and a ventilator capacity threshold (80%). It also depends on parameters provided by the Task Force on the proportion of cases that require hospitalizations (H/C = 50%), the proportion of hospitalizations that require intensive care (ICU/H = 18%) and the proportion of ICU that require ventilators (V/ICU = 77%), which are then used to derive the proportion of cases that require ventilators (V/C = 6.93%). All of these parameters are then used to calculate the metric of interest: *the daily % increase in cases within the chosen time period for which the chosen ventilator capacity threshold is **not** violated*.

An extension of the model is provided in the Excel file accompanying this document. The principal intention of this contribution is to increase efficiency when using the model to answer questions within its framework. No additional parameters or assumptions have been added; pre-existing parameters (ie: anything and everything in parenthesis above) have simply been made readily editable. This allows for real-time assessment on the impacts of new information regarding any parameter(s) on the metric of interest. Moreover, it allows for entertaining certain hypotheticals (ex: "what if we had X more ventilators available?")

II. Model Setup

1. Legend

Yellow parameters are readily editable:

- Period of Length (in days)
- Quantity of cases on Day #1
- Ventilators Available
- Ventilator Threshold (%)
- Share of cases that were hospitalized
- Share of hospitalized that require ICU
- Share of ICU that require ventilators

Orange parameters are derived from the previous; **avoid directly editing them**, as they directly feed into the results table:

- Share of cases that require ventilators
- Ventilator Threshold (in count)
- Quantity of cases on Day #LAST

The result, or maximum average daily percentage (%) increase in cases such that the ventilator threshold is not crossed, is displayed in blue and update real-time as parameters are edited. A graph which updates real-time as well is provided.

2. How to use

The user will only input initial parameters marked in yellow. The spreadsheet will then derive intermediate parameters marked in orange. The ventilator threshold (in count) for whichever day is last

is used to derive the maximum number of cases on that day such that the threshold is respected. This can be treated, thus, as the ventilator threshold in terms of quantity of cases on the last day.

The spreadsheet proceeds to use the (i) chosen period length, (ii) estimated quantity of cases on day one, and (iii) derived quantity of cases on the last day to calculate the result: the average daily increase in cases. This metric represents the maximum average % increase in COVID-19 cases such that the ventilator threshold is not violated.

III. Results

Using the parameters provided, primary results are that the healthcare system in the territory has capacity for no more than a 6.23% daily increase in cases. The secondary result is provided simply to show the functionality of the file. In this case, the period length was increased from 30 to 50 days, and ventilators available increased from 500 to 700. This leads to a result of 4.36% daily increase in cases such that the threshold is not violated.

IV. Hospitalizations & ICU based models

The final extensions for the model are simply setting the healthcare capacity system's threshold in terms of hospitalizations or ICUs. Both models are setup in the file such as to identically replicate the ventilator model's result (i.e.: 6.23% increase in daily cases results described above). On this model at day thirty (30) the system can hold 5,772 Covid-19 positive cases.

The replication folder contains a video clip and text file describing how to set up replications if changes are made to the ventilator model's parameters. In summary, we simply want all parameters to be the same. The challenge is that the # available, thresholds in %, and thresholds in count are expressed in terms of hospitalizations, ICUs, and ventilators in each respective model. If these parameters (specifically the first two, which are readily editable) are changed in model A and replication is to be maintained in model B, there is some derivation involved in order to determine model B's parameters' appropriate values. Changes to any other parameters are simpler. They (ex: period length, H/C, etc.) are treated as universal; if one is manually changed in one model, it simply needs to be manually changed to the same value in the other model. The replication folder dives deeper into this process such that the models' validities can be readily verified.

The screenshots of parameters and the resulting graphs in both cases are provided below.

parameters	values
Period Length (in days, max 100)	30
Cases (D#ONE)	1000
Ventilators Available	500
Ventilators Threshold (%)	80%
Hospitalized/Cases	50%
ICU/Hospitalized	18%
Ventilators/ICU	77%
intermediate parameters	values
Ventilators/Cases	6.93%
Ventilator Threshold (in count)	400
Cases (D#LAST)	5772
results	values
max acceptable daily % increase in cases	6.23%

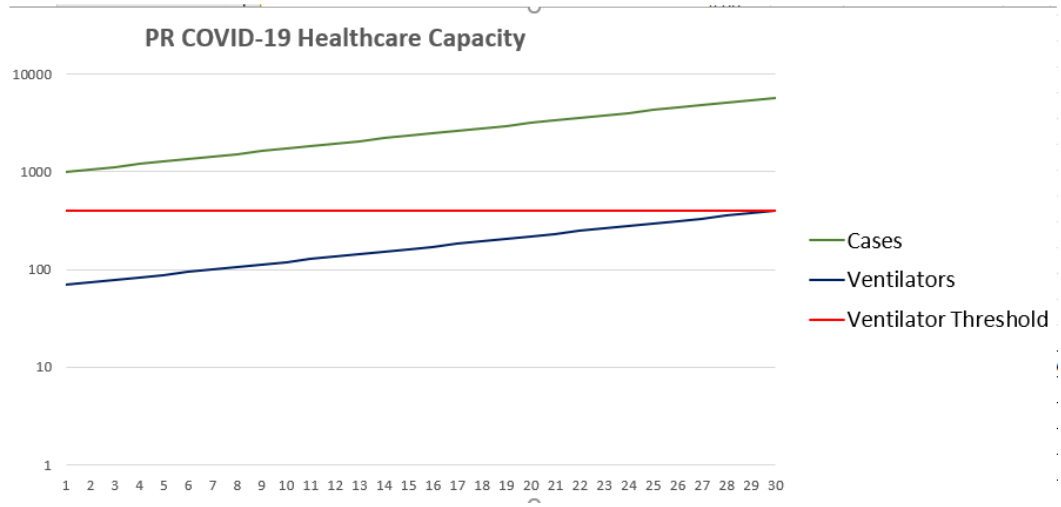


Figure 5: Primary Results

parameters	values
Period Length (in days, max 100)	50
Cases (D#ONE)	1000
Ventilators Available	700
Ventilators Threshold (%)	80%
Hospitalized/Cases	50%
ICU/Hospitalized	18%
Ventilators/ICU	77%
intermediate parameters	values
Ventilators/Cases	6.93%
Ventilator Threshold (in count)	560
Cases (D#LAST)	8081
results	values
max acceptable daily % increase in cases	4.36%

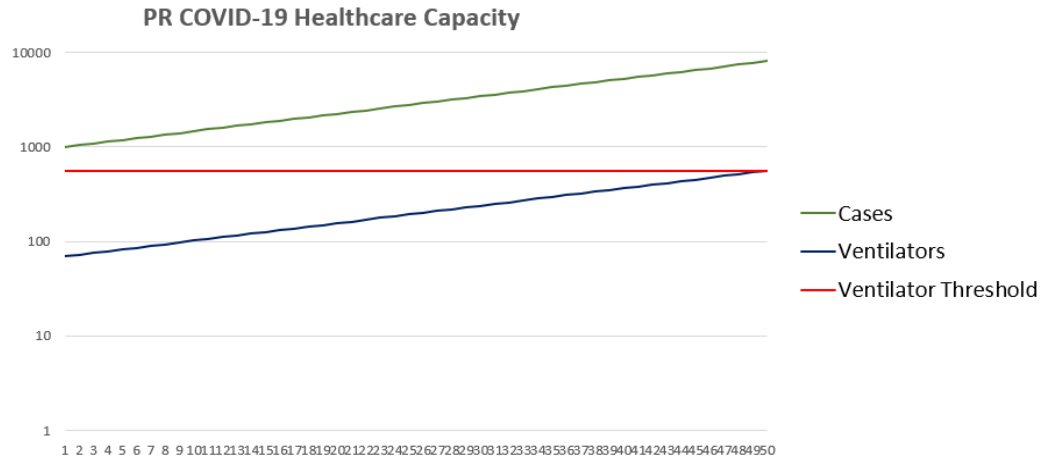


Figure 6: Secondary results

COVID -19 PRIVATE SECTOR RE-OPENING GUIDELINES

Prepared for
PR Business Operations Center
COVID-19 Puerto Rico Economic Advisory Board

Disclaimer: This guideline document, developed for the PR-BEOC and the PR Economic Advisory Board, is intended to provide general guidance on COVID-19 risk factors and non-pharmaceutical interventions measures as described in the available Centers for Disease Control and Prevention (CDC) Guidelines, PROSHA Guidelines and World Health Organization (WHO) public documents as of April, 21 2020. This document is not intended to provide medical guidelines or address medical concerns or specific risk circumstances. and is not a substitute for professional medical advice, diagnosis or treatment. It is intended for informational purposes only, and does not provide any guarantee of outcome. The information contained within is gathered and shared from reputable sources; however, DGF Consulting Group is not responsible for errors or omissions in reporting or in any conclusion put forth by any of such sources. This document is not intended to provide specific recommendations for the PR-BEOC or the PR Economic Advisory Board to follow. Due to the dynamic nature of infectious diseases, DGF Consulting Group, its parent company, affiliates, subsidiaries and other officers, directors, and employees cannot be held liable for the use, reference to, or reliance on the guidance provided. We strongly encourage PR-BEOC and the PR Economic Advisory Board, the Business Community and the Organizations in Puerto Rico to continuously seek the assistance of a professional to adapt, and adopt this guidelines to its business, as well as to continuously seek additional safety, medical, and epidemiologic information from credible sources such as the CDC, Puerto Rico Department of Health, PROSHA, OSHA and the WHO.

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Revision 14

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EXECUTIVE SUMMARY

On March 12, 2020, the Governor of Puerto Rico declared an emergency state related to the imminent impact of Coronavirus in the Island.[1] Since March 12th, the Governor of Puerto Rico has issued several Executive Orders limiting the economic activity to slow and stop transmission, prevent outbreaks, and delay the spread of the virus. On March 23, 2020, a Health Advisory Board, namely the "Health Task Force", was activated by Executive Order 2020-026 with the responsibility of performing studies, investigations, and development of strategic plans to manage the emergency and the coordinated response to the pandemic. On the same date, an Economic Advisory Board, namely the "Economic Task Force", was formally activated by the Governor of Puerto Rico utilizing the governance provided by the PR-Business Emergency Operations Center (PR-BEOC) in accordance to the requirements of the Joint Operational Catastrophic Incident Plan (JOCIP). The Economic Task Force integrated all of the PR-BEOC leaders that represent the Critical Infrastructure Sectors as defined by the Department of Homeland Security, economists, and industry leaders representing several associations. The role of the "Economic Task Force" is to provide recommendations to minimize COVID-19 impact on the economic activity of Puerto Rico.

As recommended by the WHO guidelines, all government plans should aim to minimize the impact on health systems, social services, and economic activity. To that intent, the "Economic Task Force" has developed a phased re-opening model that considers critical economic indicators and health system capacity criteria. The model is intended to provide guidance for the orderly re-opening of the economic sectors without affecting the virus spread nor the health system capacity. Recognizing that all sectors are different and that a one fits all model is not sustainable, the "Economic Task Force" approved the development and distribution of guidelines that serve as a template for individual business plans in preparation for re-opening or for resuming physical or virtual operations when, by Executive Order of the Governor of Puerto Rico, a particular economic sector re-opening is granted.

The purpose of this document is to provide guidance for the assessment of risks of SARS-CoV-2 transmission in businesses in order to identify and implement mitigation measures to reduce risks to employees and customers. The model that supports the phased re-opening of the businesses, is based on the ability of the private sector to implement measures that reduce the transmission, thereby not affecting the Puerto Rico Health System capacity to provide adequate care to COVID-19 positive cases. It Is imperative that businesses maintain the most rigorous controls to minimize the transmission of the virus among employees and clients.

DGF Consulting Group acknowledges and thanks the contribution of all the reviewers in the revision of this guidelines.

[1] Boletín administrativo Núm. OE2020-020, Orden Ejecutiva de la Gobernadora de Puerto Rico Wanda Vázquez Garced, para declarar un Estado de Emergencia ante el Inminente Impacto del Coronavirus (COVID-19) en Nuestra Isla. x), Available from: (https://www.estado.pr.gov/en/executive-orders/)

Disclosures

This guidance is not a standard or regulation, and it creates no new legal obligations. It contains recommendations, as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist employers in providing a safe and healthful workplace.

Re-Opening Criteria

Economic Sectors re-opening sequence will be granted by the Governor of Puerto Rico, by means of an Executive Order, considering recommendations provided by the Economic Task Force and the Medical Task Force.

Re-opening of any company in Puerto Rico, requires the development and implementation of a COVID-19 Business Re-Opening Plan describing the risk evaluation process followed and the non-pharmaceutical interventions implemented.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico or his designee to ensure there is a mechanism in place to update the COVID-19 Business Re-Opening Plan as new OSHA, PROSHA, or CDC guidelines are published.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico or his designee to ensure there is a protocol to make certain that all employees are properly trained and understand the COVID-19 Business Re-Opening Plan developed by the Company.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico or his designee to maintain a list of all the active employees.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico or his designee to submit a report providing the number of active employees, the number of COVID-19 positive results of any active employee, the number of quarantined employees, and any other relevant information in the frequency established by the Department of Economic Development and Commerce. For the purposes of the report an active employee is an employee that is not working from home.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to submit a COVID-19 Self-Certification Notification to the Puerto Rico Occupational Safety and Health Administration via e mail, using PROSHA Form FC-101 "Auto Certificación Patronal – Plan Patronal de Control de Exposición a COVID-19".

Re-opening of any Company will be effective immediately after the submission and completeness of the COVID-19 Self-Certification Notification to the Puerto Rico Occupational Safety and Health Administration (PROSHA) .

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to approve the Business Re-Opening Plan.

Guiding principles

Each economic sector is unique; therefore, appropriate mitigation strategies will vary based on the level of community transmission, characteristics of the organization , their employees, customers, and the capacity to implement protection and mitigation strategies.

Each Company or Organization that intends re-opening must assess all aspects of the working spaces that might be impacted, including employees most vulnerable to severe illness and those that may be more impacted socially or economically, and select appropriate actions.

Each Company or Organization must identify exposure risk and mitigation strategies that can be scaled up or down depending on the evolving local, municipal or island-wide situation.

When developing non-pharmaceutical interventions measures, employers should identify ways to ensure the safety and social well-being of employees that may be especially impacted by mitigation strategies, including individuals at increased risk of severe illness.

Activation of a company's emergency plans is critical for the implementation of non-pharmaceutical interventions measures related to COVID-19. These plans may provide additional authorities and coordination needed for interventions to be implemented.

Depending on the level of community spread of COVID-19, the company may need to implement mitigation strategies for employees to identify cases and conduct contact tracing within the organization.

OSHA General Guidance [2]

Each Company shall consider the following steps to reduce Active Workers' risk of exposure to COVID-19:

1. Develop a COVID-19 Preparedness and Response Plan
2. Implement Basic Infection Prevention Measures
3. Develop Policies and Procedures for Prompt Identification and Isolation of Sick People, if Appropriate
4. Develop, Implement, and Communicate about Workplace Flexibilities and Protections
5. Implement Workplace Controls

[2] Guidance on Preparing Workplaces for CoVID-19, Available from: https://www.osha.gov/Publications/OSHA3990.pdf

COVID-19 RE-OPENING GUIDELINES

TABLE OF CONTENTS

DISCLOSURE

This document is internal guidance developed for the Private Sector to establish requirements for the management and protection of the employees. It is not a standard or regulation, imposed or mandated by any regulatory agency, local or federal, and it creates no new legal obligations. It contains recommendations as well as descriptions of mandatory safety and health standards. The recommendations are advisory in nature, informational in content, and are intended to assist companies in providing a safe and healthful workplace for the employees and the customers. Employers are recommended to consult their occupational safety and legal advisors in order to devise protocols for workplace safety tailored to their particular needs.

INTRODUCTION

In December 2019, an unprecedent outbreak of pneumonia of unknown etiology emerged in Wuhan City, Hubei province of China. A novel coronavirus was identified as the agent responsible for the outbreak. On 30th January 2020, the World Health Organization (WHO) declared the Chinese outbreak to be a Public Health Emergency of International Concern, posing a high risk to countries with vulnerable health systems. On February 11, 2020, WHO termed the virus that causes the **co**rona**vi**rus **d**isease of 20**19** as COVID-19. On March 11th, 2020, as a result of the 13-fold increase number of cases outside of China and the triplication of the number of affected countries, WHO characterized COVID-19 as a pandemic.[3]

A pandemic is a global outbreak of disease. Pandemics happen when a new virus emerges to infect people and can spread between people sustainably. Because there is little to no pre-existing immunity against the new virus, it spreads worldwide.[4] For this to happen, the virus must be able to infect people and, the spread of person to person must be efficient and sustained.[5]

On March 19, 2020, WHO[6] alerted all countries to prepare to respond to different health scenarios recognizing that a one fits all approach for COVID-19 was not feasible. WHO recommendations reinforced the need for countries to assess their risk and implement necessary measures at the appropriate scale to reduce both the COVID-19 transmission and the economic, public, and social impacts. WHO recommended that all countries preparedness and response plans for COVID-19 should aim to:

- Slow and stop transmission, prevent outbreaks, and delay spread
- Provide optimized care for all patients, especially the seriously ill

[3] WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020), Available from: (https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020)

[4] CDC Coronavirus Disease 2019 (COVID-19), Situation Summary.), Available from: (https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/summary.html)

[5] PLANTILLA Plan de Continuidad de Operaciones ante una Pandemia para agencias, organizaciones y negocios, Departamento de Salud de PR, Rev Feb 2020

[6] Critical preparedness, readiness and response actions for COVID-19, Interim Guidance, World Health Organization, 19 MARCH, 2020 (WHO/2019m-CoV/Community Actions/2020.3), Available from: (https://www.who.int/publications-detail/critical-preparedness-readiness-and-response-actions-for-covid-19)

- Minimize the impact of the epidemic on health systems, social services, and economic activity

On April 16, 2020, the United States President released guidelines for states, cities, and countries to start easing Coronavirus restrictions. The guidelines, presented in phases, define the individuals and the employers' responsibilities, requiring the development and implementation of appropriate policies in accordance with Federal, State and local regulations and guidance, and informed industry best practices regarding: social distancing, protection equipment, temperature checks, sanitation of common and high-traffic areas, disinfection and business travel

Puerto Rico:

On March 12, 2020, the Governor of Puerto Rico declared an emergency state related to the imminent impact of Coronavirus in the Island.[7] Since March 12th, the Governor of Puerto Rico has issued several Executive Orders limiting the economic activity to slow and stop transmission, prevent outbreaks, and delay the spread. On March 23, 2020, a MedicalAdvisory Board, namely the "MedicalTask Force", was activated by Executive Order 2020-026 with the responsibility of performing studies, investigations, and development of strategic plans to manage the emergency and the coordinated response to the pandemic. On the same date, an Economic Advisory Board, namely the "Economic Task Force", was formally activated by the Governor of Puerto Rico utilizing the governance provided by the PR-Business Emergency Operations Center (PR-BEOC) in accordance to the requirements of the Joint Operational Catastrophic Incident Plan (JOCIP). The Economic Task Force integrated all of the PR-BEOC leaders that represent the Critical Infrastructure Sectors as defined by the Department of Homeland Security economists, and industry leaders representing several associations. The role of the "Economic Task Force" is to provide recommendations to minimize COVID-19 impact on the economic activity of Puerto Rico.

As recommended by the WHO guidelines, all government plans should aim to minimize the impact on health systems, social services, and economic activity. To that intent, the "Economic Task Force" has developed an economic re-opening model that considers critical economic indicators and health system capacity criteria. The model is intended to provide guidance for the orderly re-opening of the economic sectors without affecting the spread nor the health system capacity. Recognizing that all sectors are different and that a one fits all model is not sustainable, the "Economic Task Force" approved the development and distribution of guidelines that serve as a template for individual business re-opening plans in preparation for opening or for resuming physical or virtual operations when, by Executive Order of the Governor of Puerto Rico, a particular economic sector re-opening is granted.

[7] Boletín administrativo Núm. OE2020-020, Orden Ejecutiva de la Gobernadora de Puerto Rico Wanda Vázquez Garced, para declarar un Estado de Emergencia ante el Inminente Impacto del Coronavirus (COVID-19) en Nuestra Isla. x), Available from: (https://www.estado.pr.gov/en/executive-orders/)

OBJECTIVES

During a pandemic, employers play an essential role in protecting employee health and limiting negative impacts on the economy and society. This document provides guidance for businesses to re-open their operations and maintain their essential services and operations during and after the period of the COVID-19 emergency declaration in Puerto Rico, while minimizing the impact of the pandemic to the health system capacity, and the contagion of the employees and customers.

ABOUT COVID-19[8]

Coronaviruses are a large family of viruses that may cause illness in humans or animals. In humans, several coronaviruses are known to cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome[9] (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recently discovered coronavirus causes coronavirus disease COVID-19.[10] Coronaviruses are single strand enveloped RNA virus belonging to the family of *Coronaviridae* of zoonotic origin.

COVID-19 is the clinical syndrome associated with SARS-CoV-2 infection, which is characterized by a respiratory syndrome with a variable degree of severity, ranging from a mild upper respiratory illness to severe interstitial pneumonia and Acute Respiratory Distress Syndrome (ARDS).[11] Coronaviruses are named for the crown appearance on electron microscopy. There are four genera of the coronaviruses, known as alpha, beta, gamma, and delta.[12] The SARS-CoV-2 virus is a betacoronavirus, like MERS-CoV and SARS-CoV.

SYMPTOMS

According to the Centers for Disease Control and Prevention CDC, generalized symptoms may appear 2-14 days after exposure . [13]

- Cough
- Shortness of breath or difficulty breathing

Or at least two of these symptoms

[8] *COVID-19 information is constantly evolving, therefore; it is strongly recommended to seek additional safety, medical and epidemiologic information from credible sources such as the Centers for Disease Control and Prevention (CDC), Puerto Rico Department of Health, PROSHA, OSHA and the World Health Organization (WHO).*

[9] CDC, Middle East Respiratory Syndrome (MERS), Available from: https://www.cdc.gov/coronavirus/mers/index.html

[10] World Health Organization : Geneva, Q&A on coronaviruses (COVID-19), 8 April 2020/Q&A, Available from: https://www.who.int/news-room/q-a-detail/q-a-coronaviruses

[11] COVID-19, SARS, and MERS: are they closely related? , N. Petrosillo et all, Available from: https://doi.org/10.1016/j.cmi.2020.03.026

[12] CDC, Human Coronavirus Types, Available from: (https://www.cdc.gov/coronavirus/types.html)

[13] CDC Coronavirus Disease 2019 (COVID-19 Symptoms of Coronavirus, April 28,2020 Available from : https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

- Fever
- Chills
- Repeated shaking with chills
- Muscle pain
- Headache
- Sore throat
- New loss of taste or smell

In addition to the symptoms presented in the CDC guidelines, WHO[14] also includes tiredness as a common symptom. Other symptoms reported[15] may include diarrhea, abdominal pain, severe vomiting and neurological changes. The list of symptoms is not all-inclusive; therefore, CDC and WHO recommends consulting a medical provider for any symptoms of concern.

HOW COVID-19 SPREADS

According to CDC guidelines[16] and the PR Department of Health available information as of the date of the approval of this guideline, COVID-19 is thought to be spread mainly from person to person.

- Between people who are in close contact with one another (within about 6 feet).
- Through respiratory droplets produced when an infected person coughs, sneezes, or talks that can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.

It may be possible that a person can get COVID-19 by touching a surface or object that has SARS-CoV-2 on it and then touching their mouth, nose, or possibly their eyes, but this is not thought to be the primary way the virus spreads.[17,18]

Viral shedding by asymptomatic people may represent 25–50% of total infections.[19]

- Viral shedding may antedate symptoms by 1–2 days.
- Viral titers are highest in the earliest phases of infection.

[14] WHO, Coronavirus, April 28,2020 Available from: https://www.who.int/health-topics/coronavirus#tab=tab_3
[15] Coronavirus disease 2019, Mayo Clinic, April 30,2020, Available from: https://www.mayoclinic.org/diseases-conditions/coronavirus/symptoms-causes/syc-20479963
[16] CDC, Coronavirus disease 2019, How it Spreads, Available from: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html
[17] CDC, Guidance on Preparing Workplace for COVID -19, OSHA 3990-03 2020 Available from: https://www.osha.gov/Publications/OSHA3990.pdf
[18] Who, Coronavirus, April 28, 2020, Available from: https://www.who.int/news-room/q-a-detail/q-a-coronaviruses
[19] Auwaerte, Paul, April 27,2020 John Hopkins ABX Guide Available from: https://www.hopkinsguides.com/hopkins/view/Johns_Hopkins_ABX_Guide/540747/all/Coronavirus_COVID_19__SARS_CoV_2_

COVID-19 PLAN

Scope:

To define specific non-pharmaceutical interventions measures adopted by any privately or publicly owned company or organization based in Puerto Rico, whose workforce is active or plans to be active, to mitigate COVID-19 potential employee exposure risks related to workplace activities.

Roles and Responsibilities:

6. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a mechanism in place to update the COVID-19 Business Re-Opening Plan as new OSHA, PROSHA, or CDC guidelines are published.
7. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a protocol to make certain that all employees are properly trained and understand the COVID-19 Business Re-Opening Plan developed by the Company.
8. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to maintain a list of all the active employees.
9. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to submit a report providing the number of active employees, the number of COVID-19 positive results of any active employee, the number of quarantined employees, and any other relevant information in the frequency established by the Puerto Rico Department of Labor and or the Department of Economic Development and Commerce. For the purposes of the report an active employee is an employee that is not working from home.
10. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to approve the Business Re-Opening Plan.
11. It is the responsibility of the Company's highest-ranking official based in Puerto Rico to submit a COVID-19 Self-Certification Notification to the Puerto Rico Occupational Safety and Health Administration.

Non-Pharmaceutical Interventions:

Any Active Company shall maintain an actualized list of all employees defined as an "active workforce." For this plan, an active workforce refers to all employees that are working for the company excluding employees working from home.

Any Active Company needs to complete a risk assessment considering the elements included in the "Risk Assessment Tool" included in Appendix 1: Risk Assessment and Exposure Control Measures Tool.

Any Active Company needs to document the measures adopted to mitigate COVID-19 risks identified as a result of the risk assessment process.

Table 1: Non-Pharmaceutical Interventions[20]

	DESCRIPTION
Employee Related Controls	
Family Nucleus Exposure Risk	Actions aimed to mitigate the impact associated to employees exposure to family members that work in high risk jobs as defined in page 19 FAMILY NUCLEUS EXPOSURE:
Community Exposure Risks	Actions aimed to mitigate the impact associated to community exposure as defined in page 17 GEOGRAPHICAL EXPOSURE
Age Bracket Risks	Actions aimed to provide special accommodations for personnel who are over 65 years old.
Underlying Medical Conditions Risks	Actions aimed to provide special accommodations for personnel with underlying medical conditions that increase the risk of serious COVID-19 for individuals of any age listed in Appendix 2: Underlying medical conditions that increase risk of serious COVID-19 for individuals of any age.
Workplace Related and Engineering Controls	
Facility Occupancy	Actions aimed to reduce the occupancy of working areas, and buildings as compared to approved building capacity provided in the operational permits.
Use of Common Areas	Actions aimed to close or minimize the use of common areas where personnel are likely to congregate and interact.
HVAC Modifications	Actions aimed to modify the number of air changes or to increase the volume of air in working rooms for facilities with HVAC units.
Contact Surfaces Cleaning, Concurrent Disinfection	Actions aimed to modify and increase housekeeping practices, including routine cleaning and disinfecting of surfaces, equipment, and other elements of the work environment. When choosing cleaning chemicals, employers should consult information on Environmental Protection Agency (EPA)-approved disinfectant labels with claims against emerging viral pathogens. Products with EPA-approved emerging viral pathogens claims are

[20] OSHA Guidance on Preparing Workplace for COVID-19 , Apr 28,2020, Available from: https://www.osha.gov/Publications/OSHA3990.pdf

	expected to be effective against SARS-CoV-2 based on data for harder to kill viruses. Follow the manufacturer's instructions for use of all cleaning and disinfection products (e.g., concentration, application method and contact time, PPE).
Personal Hygiene Practices	Actions aimed to promote and increase hand washing practices, either with soap and water or using alcohol-based hand rub s containing at least 60%, especially after touching frequently used items or surfaces.
Client Exposure	Actions aimed to reduce employee exposure to clients. Actions may include requiring personal protection equipment such as masks to clients, installing installation of physical barriers, use of drive through facilities, implementing on-line sale with home delivery or product pick up services.
Surveillance and Employee Protection Controls[21]	
Employee Surveillance Controls	Actions aimed to implement surveillance practices such as daily temperature check.
Use of personal of mask in addition to required Protection Equipment (PPE) Controls	Actions aimed to require and provide personal mask protection equipment, including but not limited to masks, respirators, gloves, eye protection to employees.

Social Distancing Controls[22]

Any Active Company needs to document the social distancing controls adopted to mitigate COVID-19 risks identified as a result of the risk assessment process.

Table 2 Social Distancing Controls

	DESCRIPTION
Work layouts modifications	Actions aimed to increase distance between coworkers' clients and service providers in a working area.
Physical areas demarcation	Actions aimed to provide a visual signal to maintain distance between co-workers, clients and service providers in a working area.
Physical barriers	Installation of physical barriers to minimize direct contact, such as plastic shields or glasses in service counters and offices.

[21,21] Guidelines Opening Up America Again, Available from https://www.whitehouse.gov/openingamerica/

Use of shared equipment (telephones, chairs, working tables) modifications	Actions aimed to minimize the use of shared equipment.
Work hours modifications	Actions aimed to reduce the facility occupancy.
Flexible work plan modifications (ex. work from home)	Actions aimed to reduce number of active workers.
Work from home protocol for personnel who are members of a vulnerable population.	Protocols describing the special accommodations for personnel who are members of a vulnerable population.
Common areas layouts modifications	Actions aimed to increase distance between coworkers' clients and service providers in a common area.

Administrative Controls

Any Active Company needs to document the Administrative Controls adopted to mitigate COVID-19 risks identified as a result of the risk assessment process.

Table 3 Administrative Controls

	DESCRIPTION
COVID-19 Illness Notification Protocol	Development and implementation of guideline or procedure for employees to report when they are sick or experiencing symptoms of COVID-19.
COVID-19 Employee Surveillance Protocol	Development and implementation of guideline or procedure for the prompt identification of potentially infectious individuals.
COVID-19 Person Under Investigation Isolation Protocol	Development and implementation of guideline or procedure for the prompt isolation of people who have signs and/or symptoms of COVID-19.
COVID-19 Visuals Aids	Posting of COVID 19 Visual Aids
COVID -19 Employee Self-Monitoring programs	Development and implementation of guideline or procedure for employees to self-monitor for signs and symptoms of COVID-19 if they suspect possible exposure
COVID -19 Management of Breaks and Food Periods	Development and implementation of guideline or procedure.
COVID -19 Use of Common Areas	Development and implementation of guideline or procedure.
COVID -19 Risk Notification	Development and implementation of guideline or procedure.
COVID -19 Respiratory Etiquette	Development and implementation of guideline or procedure.

COVID -19 Hand Washing	Development and implementation of guideline or procedure.
COVID -19 Remote Meeting Management	Development and implementation of guideline or procedure.
COVID -19 Non-essential Travel	Development and implementation of guideline or procedure.
COVID-19 Use of PPE	Development and implementation of guideline or procedure.
COVID-19 Employee Training in new protocols and procedures	Maintain documented evidence of employee and contractors training.
COVID-19 Workforce Contact Tracing	Development and implementation of guideline or procedure.

INCIDENT MANAGEMENT PLAN

The Incident Management Plan describes the steps that will be followed in the event of a Person Under Investigation (PUI) or a laboratory-confirmed test of COVID-19 is reported by an employee belonging to the active workforce. Incident management program shall include:

1. Active Employees list by site, shift, and municipality.
2. Quarantine protocol: A quarantine protocol defines the steps the Company will follow in the event of an active employee notifies of a positive Polymerase Chain Reaction (PCR) test .
3. Cleaning and Disinfecting protocols: The Cleaning and Disinfecting protocols define the steps the company will follow to perform surface cleanings and areas disinfection when needed or is triggered by a positive COVID-19 test result of an employee belonging to the "active workforce."
4. Return to Work (RTW) protocol: An RTW protocol defines the steps the Company will follow to re-activate operations after a COVID-19 related incident is reported.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to maintain a list of all the active workforce.

COMMUNICATION PLAN

During an emergency, such as COVID-19, it is essential to address all the organization's stakeholders. See
Appendix 4: Communication Plan

1. Internal Communication Plan: An internal communication plan describes the process to be used to reach out to employees.

2. External Communication Plan: An external communication plan describes the process to be used to reach out to shareholders, clients, providers, contractors, union leaders, retirees, and community, including notification to the required authorities of COVID-19 suspects or positive for contact tracing purposes.

COVID-19 INDEX

Each Company will estimate the COVID-19 Index for internal reference purposes only. See:
People 65 years and older
People with chronic lung disease or moderate to severe asthma
People who have serious heart conditions

1. People who are immunocompromised
    a. Many conditions can cause a person to be immunocompromised, including cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications
2. People with severe obesity (body mass index [BMI] of 40 or higher)
3. People with diabetes
4. People with chronic kidney disease undergoing dialysis
5. People with liver disease

Appendix 3: COVID-19 Index Template.

SUCCESSION PLAN

Each Company will define a COVID-19 succession plan, identifying the line of command that activates in the event the highest-ranking officer in not available.

ENFORCEMENT

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a protocol to ensure all employees are properly trained and understand the COVID-19 Business Re-Opening Plan developed by the Company.

SELF-CERTIFICATION NOTIFICATION

Each Company will prepare and submit via email Self-Certification PROSHA Form 101 *"Auto Certificación Patronal – Plan Patronal de Control de Exposición a COVID-19"* to PROSHA.

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to submit a COVID-19 Self-Certification Notification to the Puerto Rico Occupational Safety and Health

Administration via email, PROSHA Form FC-101 "Auto Certificación Patronal – Plan Patronal de Control de Exposición a COVID-19".

EFFECTIVE DATE

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to ensure there is a mechanism in place to update the COVID-19 Business Re-Opening Plan as new OSHA, PROSHA, or, CDC guidelines are published.

Each Company will define a COVID-19 plan effective date, plan revision number and plan revision dates, as new CDC, PROSHA, WHO recommendations become available.

APPROVAL

It is the responsibility of the Company's highest-ranking official based in Puerto Rico to approve the Business Re-Opening Plan.

APPENDIX

Appendix 1: Risk Assessment and Exposure Control Measures Tool

Risk Assessment

The COVID-19 Index considers the risk factors weight is as follows:

1. High: 10
2. Medium: 5
3. Low: 1

I. *FAMILY NUCLEUS EXPOSURE:*

Classify level of exposure risk of the active workforce to other family members that are active workers in sectors with a very high, high, medium or low exposure as defined in OSHA Guideline 3990-03 20[23].

1. HIGH RISK: Any active employee with direct contact in the family nucleus to jobs classified as Very High or High exposure risk as defined in OSHA guidelines.
    a. Healthcare workers (e.g., doctors, nurses, dentists, paramedics, emergency medical technicians) performing aerosol-generating procedures (e.g., intubation, cough induction procedures, bronchoscopies, some dental

[23] Guidance on preparing workplace for COVID-19, OSHA 3990-03-20

procedures and exams, or invasive specimen collection) on known or suspected COVID-19 patients.

b. Healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients (e.g., manipulating cultures from known or suspected COVID-19 patients).
c. Morgue workers performing autopsies, which generally involve aerosol-generating procedures, on the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.
d. Healthcare delivery and support staff (e.g., doctors, nurses, and other hospital staff who must enter patients' rooms) exposed to known or suspected COVID-19 patients. (Note: when such workers perform aerosol-generating procedures, their exposure risk level becomes *very high.*)
e. Medical transport workers (e.g., ambulance vehicle operators) moving known or suspected COVID-19 patients in enclosed vehicles.
f. Mortuary workers involved in preparing (e.g., for burial or cremation) the bodies of people who are known to have, or suspected of having, COVID-19 at the time of their death.

2. MEDIUM RISK: Any active employee with direct contact in the family nucleus to jobs classified as Medium exposure risk as defined in OSHA guidelines.
    a. Medium exposure risk jobs include those that require frequent and/or close contact with (i.e., within 6 feet of) people who may be infected with SARS-CoV-2, but who are not known or suspected COVID-19 patients.
    b. Workers that live in areas without ongoing community transmission but may have frequent contact with travelers who may return from international and US locations with widespread COVID-19 transmission.
    c. Employees that live in where there is ongoing community transmission, workers in this category may have contact with the general public (e.g., schools, high-population-density work environments, some high-volume retail settings).
3. LOW RISK: Any active employee with direct contact in the family nucleus to jobs classified as Low exposure risk as defined in OSHA guidelines.
    a. Lower exposure risk (caution) jobs are those that do not require contact with people known to be, or suspected of being, infected with SARS-CoV-2 nor frequent close contact with (i.e., within 6 feet of) the general public. Workers in this category have minimal occupational contact with the public and other coworkers.

II. GEOGRAPHICAL EXPOSURE

Classify the level of geographical risk of the active workforce according to the geographic region they reside in.

1. HIGH RISK: Any active employee residing in a municipality with positive molecular cases in the upper quantile of PR case distribution.
2. MEDIUM RISK: Any active employee residing in a municipality with positive molecular cases within the upper and lower quantile of PR case distribution.
3. LOW RISK: Any active employee residing in a municipality with positive molecular cases molecular in the lower quantile of PR case distribution.

III. AGE BRACKET:

Classify the level of contagious risk due to age factor according to the distribution of the active workforce.

1. HIGH RISK: Any active employee age greater than or equal to 65 years[24]
2. LOW RISK: All active employees age less than 65 years

IV. UNDERLYING MEDICAL CONDITIONS:

Classify the level of health conditions risk associated with the active workforce. NOTE: **The disclosure of any health condition must comply with the HIPPA Privacy Rule.**

1. HIGH RISK: Active workers have one or more underlying medical conditions that increase the risk of serious outcomes as defined by the CDC. See Appendix 2: *Underlying medical conditions that increase risk of serious COVID-19 for individuals of any age*
2. LOW RISK: None of the active workers have one or more underlying medical conditions that increase the risk of serious outcomes as defined by the CDC.

V. WORKSPACE EXPOSURE

1. Facility Occupancy Level
    a. HIGH RISK: 80-100% of maximum capacity as per the facility operations permit.
    b. MEDIUM RISK: 50-79% of maximum capacity as per the facility operations permit.
    c. LOW RISK: <50% of maximum capacity as per the facility operations permit.
2. Use of Common Areas; (Cafeteria, Restrooms, Locker rooms, Conference Rooms, dining areas, etc.)
    a. HIGH RISK: Common areas open. Without physical barriers, nor limitation of persons allowed over a specified time.

[24] CDC Underlying Conditions: Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/underlying-conditions.html

b. MEDIUM RISK: Common areas open with physical barriers and a limitation of persons allowed over a specified time period.
c. LOW RISK: Common areas closed.

3. HVAC Controls
    a. HIGH RISK: Facility or working space with air conditioning units without High Efficiency Particulate Air (HEPA) filtration.
    b. LOW RISK: Facility or working space with HVAC units with HEPA filtration, negative pressure rooms or open spaces.
4. Hand wash stations/ facilities
    a. HIGH RISK: Do not provide hand wash stations.
    b. LOW RISK: Hand wash stations are provided for employees only.
    c. LOW RISK: Hand wash stations are available employees and customers.

VI. CLIENT EXPOSURE

1. HIGH RISK: Requires direct contact with the public or customers for product or service delivery.
2. MEDIUM RISK: Low level of contact with the public or customers for product delivery or service delivery. (ex: Drive-through windows or home delivery)
3. LOW RISK: No level of contact with the public or customers for product or service delivery.

EXPOSURE MITIGATION CONTROLS

The COVID-19 Index considers the exposure mitigation measures weight is as follows:

HIGH: 10 (Most Effective)
Medium: 5
Low: 1 (Effective)

MEASURES

I. Physical-Social Distancing: High [25]

1. Remote Work for Employees Over 65
2. Remote Work for Employees with Underlying Medical Conditions that Increase the Risk of Serious Outcomes as Defined by the CDC.
3. Remote Work for Employees with High Family Nucleus Exposure Risk.
4. Remote Work for Employees with High Community Exposure Risk.

[25,25] Guidelines for Opening Up America Again Available from: https://www.whitehouse.gov/openingamerica/

II. Surveillance and Testing: High

1. Surveillance programs[26]
    a. Daily temperature checks for active workforce.
    b. Contact tracing program for COVID-19 positive test results.
2. COVID-19 Testing programs following the recommendations provided by the Puerto Rico Health Task Force "Uso de las Pruebas de COVID-19 en el ambiente laboral"[27] revised on April 25,2020 and those included in the CDC Testing Guidelines.[28]
    a. Molecular (PCR) test before active workforce re-activation, if positive follow CDC and Department of Health recommendations. A negative test implies that probably, the employee was not infected at the time the sample was collected. However, that does not mean that the employee will not get sick. The test result only means that the employee did not have COVID-19 at the time of testing.[29]

        Note: If the employee test positive or negative for COVID-19, no matter the type of test, the employee should take all required preventive measures established by the company. [30]

    b. Molecular (PCR) test before return to work after internal quarantine (14 days) activation, if positive follow CDC and Department of Health recommendations.

III. Personal Protection Equipment: High [31]

1. Use of N95 respirator complying with OSHA respiratory protection standards 29 CFR § 1910.134 (f)(2) and OSHA temporary enforcement guidance.[32] Only recommended by CDC for active workforce in high or very high exposure risk jobs.
2. Use of surgical mask
3. Use of goggles
4. Use of face shield: only recommended for active workforce in high or very high exposure risk jobs
5. Use of gloves: only recommended for active workforce in high or very high exposure risk jobs

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[27] PR Medical Task Force Guideline: "Uso de las Pruebas de COVID-19 en el Ambiente Laboral" Revision, April 25, 2020 Available from: https://covid19tf.rcm.upr.edu/wp-content/uploads/sites/45/2020/04/Uso-de-Pruebas-en-Ambiente-Laboral-Abril-26-20.pdf
[28] CDC, Testing for COVID-19,Apr 30,2020, Available from: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/testing.html
[29] CDC, Testing for COVID-19,Apr 30,2020, Available from: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/testing.html

[30] CDC, Testing for COVID-19,Apr 30,2020, Available from: https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/testing.html
[31,28,30] Guidelines for Opening Up America Again Available from: https://www.whitehouse.gov/openingamerica/
[32] OSHA Temporary Enforcement Guidance-Healthcare Respiratory Protection Annual Fit-Testing for N95 Filtering facepieces During COVID-19 outbreak. Available from: https://www.osha.gov/memos/2020-03-14/temporary-enforcement-guidance-healthcare-respiratory-protection-annual-fit

6. Use of gowns: only recommended for active workforce in high or very high exposure risk jobs

IV. Safe Work Practices: Medium [33]

1. Increase availability of hand rub dispensers regularly refilled with >60% alcohol-based hand rubs.
2. Provide disinfectants and disposable towels to clean workstations.

V. Engineering and Environmental Controls: Medium

1. Physical barriers for social distancing
2. Increased cleaning frequency of contact surfaces (phones, keyboards, desk, tables) [34,35]
3. Increase HVAC unit ventilation rate.
4. Install High-Efficiency air filters.
5. Install drive-through window for customer service.

VI. Employee Exposure and Social Distancing Measures: Medium

1. Work layouts modifications for social distancing
2. Common areas layouts modifications for social distancing
3. Modifications in the use of shared equipment such as telephones, keyboards, tooling.
4. Work area demarcation for physical and social distancing

VII. Administrative Controls: Medium

1. Illness notification protocol
2. Employee self-monitoring program
3. Employee family self-monitoring program
4. Respiratory etiquette protocol
5. Effective hand washing protocol
6. Facilities high contact surfaces cleaning and sanitation protocol
7. Non-essential traveling protocol
8. Terminal cleaning protocol
9. Non-essential travel protocol
10. Management of common facilities protocol
11. Quarantine management protocol
12. Virtual meeting protocol

[34] WHO, Getting your workplace ready for COVID-19 Available from: https://www.who.int/docs/default-source/coronaviruse/getting-workplace-ready-for-covid-19.pdf

13. Management of breaks and food periods protocol
14. PUI notification protocol
15. COVID-19 visuals
16. Risk notification protocol

Appendix 2: Underlying medical conditions that increase risk of serious COVID-19 for individuals of any age

Disclosure[36] : COVID-19 is a new disease and there is limited information regarding risk factors for severe disease. Based on currently available information and clinical expertise, **older adults** and **people of any age who have serious underlying medical conditions, particularly if not well controlled,** might be at higher risk for severe illness from COVID-19. Based on current information CDC guidance as of the date of this publication,[37]

6. People 65 years and older
7. People with chronic lung disease or moderate to severe asthma
8. People who have serious heart conditions
9. People who are immunocompromised
    a. Many conditions can cause a person to be immunocompromised, including cancer treatment, smoking, bone marrow or organ transplantation, immune deficiencies, poorly controlled HIV or AIDS, and prolonged use of corticosteroids and other immune weakening medications
10. People with severe obesity (body mass index [BMI] of 40 or higher)
11. People with diabetes
12. People with chronic kidney disease undergoing dialysis
13. People with liver disease

Appendix 3: COVID-19 Index Template

COVID-19 Index template is available at:
https://app.smartsheet.com/sheets/x6QC2R8gx2Vw4XXrhH36Q38cXFm7gGCWm3qQPXr1?view=grid

Table 4 COVID-19 Index

EVALUACIÓN DE FACTORES DE RIESGO Y MEDIDAS DE MITIGACION PARA ESTIMAR EL INDICE DE COVID-19	MARQUE CON X LO QUE APLIQUE	Impacto
FACTORES DE RIESGO		

[36] CDC Coronavirus Disease 2019 Update Apr 27,2020 Available at https://www.cdc.gov/coronavirus/2019-ncov/faq.html#Symptoms-&-Testing

[37] CDC Coronavirus Disease 2019, April 30,2020 Available from: https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-at-higher-risk.html

Se mantienen activos empleados que en su entorno familiar están en contacto directo con empleados que laboran en industrias de muy alto o alto riesgo según definido por PR-OSHA		10
Se mantienen activos empleados activos que en su entorno familiar están en contacto directo con empleados que laboran en industrias de riesgo mediano según definido por PR-OSHA		5
Se mantienen empleados activos que en su entorno familiar están en contacto directo con empleados que laboran en industrias de bajo riesgo según definido por PR-OSHA		1
Se mantienen empleados activos que residen en municipios con casos confirmados en el cuadrante superior de la distribución de casos en PR		10
Se mantienen empleados activos que residen en municipios con casos confirmados entre el cuadrante inferior y el cuadrante superior de la distribución de casos en PR		5
Se mantienen empleados activos que residen en municipios con casos confirmados en el cuadrante inferior de la distribución de casos en PR		1
Se mantiene empleados activos mayores de 65 años		10
Se mantiene empleados activos cuyas edades son menores a 65 años		1
Se mantienen empleados activos de cualquier edad con condiciones de salud de riesgo a efectos serios de COVID-19 establecidas en las guías del CDC		10
Solo se mantienen empleados activos sin condiciones de salud de riesgo a efectos serios de COVID-19 establecidas en las guías del CDC		1
La ocupación de la facilidad es de > 80% de lo permitido por el permiso de operación		10
La ocupación de la facilidad esta entre el 51% y el 80% de lo permitido por el permiso de operación		5
La ocupación de la facilidad es menor o igual al 50% de lo permitido por el permiso de operación		1
Se mantienen las áreas comunes abiertas y en uso		10
Se mantienen las áreas comunes abiertas, pero con controles de distanciamiento social y barreras físicas		5
No se mantienen las áreas comunes abiertas		1
La facilidad tiene ventilación provista por sistemas de aire acondicionado sin filtros de particulado de alta eficiencia		10
La facilidad tiene un sistema de ventilación central con filtros de particulado de alta eficiencia, con recirculación		5
La facilidad solo tiene sistema de ventilación central con filtros de particulado de alta eficiencia, sin recirculación		1
Los empleados activos trabajan en cuartos con presión negativa.		1
Los empleados activos operan al aire libre sin sistema de ventilación forzada.		1

La empresa no provee estaciones de higiene de mano a los empleados activos		10
La empresa provee estaciones de higiene de mano a los empleados activos		1
La empresa provee estaciones de higiene de mano a los empleados activos y clientes		1
Los empleados activos están en contacto directo con los clientes para proveer servicios o entregar productos		10
Los empleados activos tienen algún nivel de contacto mínimo con los clientes (existe facilidades de recogido por servi-carro o entrega domiciliaria)		5
Los empleados activos no tienen contacto directo con los clientes		1
MEDIDAS DE MITIGACIÓN		
Se implemento programa de trabajo desde el hogar para empleados sobre 65 años		10
Se implemento programa de trabajo desde el hogar para empleados de cualquier edad con condiciones de salud de riesgo según definidas por las guías del CDC		10
Se implemento programa de trabajo desde el hogar para empleados con alto riesgo de exposición familiar a personas trabajando en trabajos de alto o muy alto riesgo		10
Se implemento programa de trabajo desde el hogar para empleados con alto riesgo de exposición geográfica		10
Se implemento una verificación diaria de temperatura a empleados activos		10
Se implemento un programa de rastreo de contacto o "Contact Tracing" para empleados con resultados de PCR positivos		10
Se hacen pruebas moleculares (PCR) a los empleados antes de reactivar las operaciones[38]		10
Se hacen pruebas moleculares (PCR) a todos los empleados activos luego de activarse una cuarentena como resultado de un empleado activo resultar positivo a COVID-19 antes de reinstalarlos a el área de trabajo.		10
Se provee respirador N95 a los empleados activos cumpliendo con los requisitos de las guías de OSHA (donde sea requerido como EPP basado en las guías de PROSHA para áreas de trabajo con alto o muy alto riesgo)		10
Se provee mascarilla quirúrgica a los empleados activos		10
Se provee caretas o "Face Shield" a los empleados activos		10
Se provee goggles a los empleados activos		10
Se proveen guantes a los empleados activos (donde sea requerido como EPP basado en las guías de PROSHA para áreas de trabajo con alto o muy alto riesgo)		10

[38] Healthcare providers should report positive results to the PR Department of Health. The employer is not responsible to report to the PR Department of Health any positive test results.

Se proveen batas a los empleados activos (donde sea requerido como EPP basado en las guías de PROSHA para áreas de trabajo con alto o muy alto riesgo)		10
Se provee y se aumento la disponibilidad de dispensadores de alcohol en gel de manos (con concentración de alcohol > de 60%) para el uso de los empleados activos		5
Se provee desinfectantes y paños de limpieza para las estaciones de trabajo		5
Se colocaron barreras físicas para garantizar el distanciamiento social		5
Se aumento en la frecuencia de limpieza y desinfección de superficies de contacto y se documenta la frecuencia de limpieza		5
Se hicieron cambios para aumentar la ventilación en las áreas de trabajo		5
Se instalaron unidades de filtración de alta eficiencia en el sistema de aire acondicionado		5
Se implemento concepto de servi-carro para que los clientes recojan los productos		5
Se hicieron cambios al diseño en las áreas de trabajo para lograr distanciamiento social		5
Se hicieron cambios al diseño en áreas de uso común para lograr distanciamiento social		5
Se hizo demarcación física de áreas de trabajo para lograr distanciamiento social (6 pies)		5
Se hicieron modificaciones al uso de equipo común.		5
Se tienen protocolo de comunicación de condiciones de salud asociadas a COVID-19		5
Se implementaron programas de auto vigilancia para empleados		5
Se implementaron programas de auto vigilancia para familiares viviendo con empleado		5
Se capacito al personal activo en reglas de etiqueta de respiración		5
Se capacito al personal activo en practicas de higiene de manos		5
Se tienen protocolos de limpieza y desinfección de superficies de alto contacto		5
Se tienen protocolos de viaje no esenciales		5
Se tiene protocolo para manejo de áreas comunes garantizando el distanciamiento físico y social		5
Se tiene un protocolo para manejo de cuarentena		5
Se tiene un protocolo para manejo de reuniones virtuales		5
Se tiene un protocolo para manejo de toma de alimentos y breaks		5
Se utilizan visuales de alerta sobre COVID-19		5
Se tiene un protocolo de notificación de riesgos a los empleados		5
Se tiene un protocolo para manejo de personas bajo investigación de contagio		5

Se llevo a cabo capacitación de empleados en guías de operación para reducir impacto y propagación de COVID-19		5
INDICE COVID-19= Suma de Impacto de Riesgos/ Suma de impacto de medidas de mitigación		

Appendix 4: Communication Plan

COMMUNICATION PLAN

A critical step for the orderly re-opening of all the economic sectors in Puerto Rico is the development and implementation of a communication plan. Communication Plans should define key stakeholders and the communication channels to be used.

Internal Communication Channels

1. Video Conference meetings
2. Email Blasts
3. Flyers for Active Employees
4. Fact Sheets
5. Checklists
6. Frequently Questions Asked Documents
7. Visual Aids (ex: CDC, WHO posters)
8. Social Media platforms

Internal Communications Elements [39,40,41]

1. Center the communications content on ensuring the safety and security of the workforce.
2. Build trust with responsive, honest, transparent, consistent and nuanced messaging that acknowledges and address workforce perceptions.
3. Always refer to reliable sources of information, ex: CDC Guidelines, PR Department of Health (DOH) Guidelines, DOH official communications, PR DOH Dashboard Data, Department of Labor Guidelines and official communications, PROSHA Guidelines, DDEC Official Communications, Executive Orders), WHO Guidelines.
4. Use plain language, state clearly and in easy to follow language the facts
5. Communicate what is known, what is unknown, and what is being done to prevent and control transmission.

[39] CDC Public Health Communications Guideline Available from: https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-communicators-get-your-community-ready.html

[40] CERC in an infectious disease outbreak , April,28, 2020 Available from: https://emergency.cdc.gov/cerc/resources/pdf/315829-A_FS_CERC_Infectious_Disease.pdf

[41] WHO Risk Communication and Community engagement guidelines April 28,2020 Available from: https://www.who.int/publications-detail/responding-to-community-spread-of-covid-19

6. Express empathy by acknowledging what your active force may be feeling and their challenges.
7. Discuss all prevention and mitigation controls implemented in the facility and the associated risks.
8. Show respect, listen to the issues and solutions brought up by your workforce.
9. Develop talking points to be used by all Company leaders
10. Establish a regular rhythm of communications
11. Discuss COVID-19 specific policies and procedures
12. If remote work policies are established, share the Information regarding applicability, tools, and processes to be followed.
13. Provide detailed instructions about what employees should do if they suspect they have been exposed to COVID-19.
14. Share your plans in the event of a notification of a positive COVID-19 active worker, communicate specific actions as it relates to co-workers, quarantine measures, return to work criteria, cleaning, and disinfection plans for affected working spaces.
15. Consider including COVID-19 financial and supply chain impact, if any, on the company.
16. Share relevant local and national situational summaries.
17. Meet with your existing emergency planning and operations team to update the emergency communication plan for your facility.
18. Share your crisis and emergency risk communication plan.
19. Keep time for questions and answers.

External Communications

1. Identify stakeholders: suppliers, clients, community, government agencies, regulators, union representatives, and retirees.
2. Define communication channel
3. Create a plan to interact with the media in the event of an incident in your facility, include a stand-by statement.
4. Identify Company spoke person and develop talking points.
5. Define communication frequency.

Appendix 5: COVID-19 Test Results Interpretation[42]

In addition to the information provided bellow, please refer to the Health Task Force Guidelines "Uso de las Pruebas de COVID-19 en el Ambiente Laboral" Revision, April 25, 2020[43].

1. The molecular or PCR test measure the presence of the SARS-CoV-2 virus is present in the person tested and it means that they can infect others around them.

[42] Developed by José F. Cordero, MD, MPH, April 30,2020
[43] "Uso de las Pruebas de COVID-19 en el Ambiente Laboral" Revision, April 25, 2020 Available from: https://covid19tf.rcm.upr.edu/wp-content/uploads/sites/45/2020/04/Uso-de-Pruebas-en-Ambiente-Laboral-Abril-26-20.pdf

2. The serology test, a blood test, measures the body's response to the SARS-CoV-2 virus infection and a very recent study suggest that the test is more likely to become positive after 7-10 days from the time that clinical symptoms start and even more reliable on or after 20 days.
3. A positive serology would suggest being exposed but does not offer an indication of whether the individual is shedding the virus.
4. A person with a positive molecular test indicates that the individual is shedding the SARS-CoV-2 virus.
5. A person with a positive serology and a negative molecular test would suggest that had the infection and is not shedding the virus at this time. The general wisdom (not scientific evidence) is that individuals in this category should be considered low risk because of potential protection from the antibodies against the SARS-CoV-2 virus. The problem is that there is no solid scientific evidence that one infection from SARS-CoV-2 virus may protect against a second infection. The high mortality among health care professionals in China, Italy, Spain, and now NYC suggests that a previous SARS-CoV-2 virus may not be enough.
6. A person negative to the serology test and negative to the molecular test would identify an individual who has not being exposed to the SARS-CoV-2 virus
7. A positive to the molecular test and negative in the serology would suggest a recent infection. Note that CDC studies suggest that between 20% and 50% of infected persons shedding the virus are asymptomatic.

Appendix 6: COVID-19 Printable Visual Aids

1. https://www.cdc.gov/coronavirus/2019-ncov/downloads/stop-the-spread-of-germs.pdf
2. https://www.cdc.gov/coronavirus/2019-ncov/downloads/stop-the-spread-of-germs-sp.pdf
3. https://www.cdc.gov/coronavirus/2019-ncov/downloads/COVID19-symptoms.pdf
4. https://www.cdc.gov/coronavirus/2019-ncov/downloads/COVID19-symptoms-sp.pdf
5. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/safe-greetings.png?sfvrsn=2e97004e_2
6. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/handshaking.png?sfvrsn=4aed53c5_2
7. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/wearing-gloves.png?sfvrsn=ec69b46a_2
8. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-ready-social-3.jpg
9. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-ready-social-2.jpg
10. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-ready-social-1.jpg
11. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-smart-if-you-develop.jpg

12. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-smart-inform.jpg
13. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-safe.jpg
14. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-kind-to-support.jpg
15. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-kind-to-address-stigma.jpg
16. https://www.who.int/images/default-source/health-topics/coronavirus/social-media-squares/be-kind-to-address-fear.jpg
17. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/protect-yourself/blue-1.png?sfvrsn=3d15aa1c_2
18. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/protect-yourself/blue-2.png?sfvrsn=2bc43de1_2
19. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/protect-yourself/blue-3.png?sfvrsn=b1ef6d45_2
20. https://www.who.int/images/default-source/health-topics/coronavirus/risk-communications/general-public/protect-yourself/blue-4.png?sfvrsn=a5317377_11
21. https://www.who.int/images/default-source/health-topics/coronavirus/pregnancy-breastfeeding/who---pregnancy---1.png
22. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-1.png
23. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-2.png
24. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-3.png
25. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-4.png
26. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-5.png
27. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-6.png
28. https://www.who.int/images/default-source/health-topics/coronavirus/masks/masks-7.png

Appendix 7: COVID-19 Educational Videos

1. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/videos
2. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/videos

3. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/videos
4. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/videos

Appendix 8: COVID-19 Myth Busters Visuals

1. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/eng-mythbusting-ncov-(15).png?sfvrsn=a8b9e94_2
2. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-sun-exposure.tmb-768v.jpg?sfvrsn=658ce588_4
3. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-breathing-exercice.tmb-768v.jpg?sfvrsn=db06f4a9_4
4. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-breathing-exercice.tmb-768v.jpg?sfvrsn=db06f4a9_4
5. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-alcohol.tmb-1920v.jpg?sfvrsn=19ea13fb_4
6. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/52.tmb-1920v.png?sfvrsn=862374e_4
7. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-cold-snow.tmb-1920v.png?sfvrsn=1e557ba_4
8. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-hot-bath.tmb-1920v.png?sfvrsn=f1ebbc_4
9. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mb-mosquito-bite.png?sfvrsn=a1d90f6_2
10. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mythbusters-27.png?sfvrsn=d17bc6bb_2
11. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/mythbusters-31.png
12. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mythbusters-25.png?sfvrsn=d3bf829c_4
13. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mythbusters-33.png?sfvrsn=47bfd0aa_4
14. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/11.png?sfvrsn=97f2a51e_4
15. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/23.png
16. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/19.png
17. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/mythbuster-2.png
18. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/mythbuster-3.png

19. https://www.who.int/images/default-source/health-topics/coronavirus/myth-busters/web-mythbusters/mythbuster-4.png?sfvrsn=e163bada_8

Appendix 9: CDC/WHO COVID-19 Related Guidelines [44]

1. CDC's Laboratory Outreach Communication System (LOCS) - Date 4/27/20
2. Meat and Poultry Processing Workers and Employers Date 4/26/20
3. Information for Clinicians on Investigational Therapeutics for Patients with COVID-19 4/26/20
4. Considerations for Alternate Care Sites 4/24/20
5. COVID-19 Travel Recommendations by Country 4/24/20
6. Human Infection with COVID-19 Person Under Investigation (PUI) and Case Report Form 4/23/20
7. Interim Guidance for Public Health Professionals Managing People With COVID-19 in Home Care and Isolation Who Have Pets or Other Animals 4/23/20
8. Public Health Recommendations after Travel-Associated COVID-19 Exposure 4/23/20
9. Use Personal Protective Equipment when caring for Patients with Confirmed or Suspected COVID 4/22/20
10. What you should know about COVID-19 to protect yourself and others 4/22/20
11. Interim Infection Prevention and Control Guidance for Veterinary Clinics During the COVID-19 Response 4/22/20
12. Strategies to Optimize the Supply of PPE and Equipment 4/22/20
13. Interim Guidance for Homeless Service Providers to Plan and Respond to Coronavirus Disease 2019 (COVID-19) 4/22/20
14. Strategies for Optimizing the Supply of N95 Respirators 4/22/20
15. Screening Clients at Homeless Shelters 4/21/20
16. CDC's role in helping cruise ship travelers during the COVID-19 pandemic 4/21/20
17. Interim Additional Guidance for Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Outpatient Hemodialysis Facilities 4/21/20
18. Households Living in Close Quarters 4/18/20
19. Interim Guidance on Management of Coronavirus Disease 2019 (COVID-19) in Correctional and Detention Facilities 4/18/20
20. Completing the Person Under Investigation (PUI) and Case Report Form 4/18/20
21. Case Report Form for Persons Under Investigation for COVID-19 4/17/20
22. What Mail and Parcel Delivery Drivers Need to Know about COVID-19 4/17/20
23. What Rideshare, Taxi, Limo, and other Passenger Drivers-for-Hire Need to Know about COVID-19 4/17/20
24. Information for Pediatric Healthcare Providers 4/17/20
25. Returning from International Travel 4/16/20

[44] CDC Coronavirus Disease 2019(COVID-19) Available from: https://www.cdc.gov/coronavirus/2019-ncov/communication/guidance-list.html?Sort=Date%3A%3Adesc

26. Public Health Communicators: Get Your Community Ready 4/15/20
27. Standard Operating Procedure (SOP) for Triage of Suspected COVID-19 Patients in non-US Healthcare Settings: Early Identification and Prevention of Transmission during Triage 4/15/20
28. Pregnancy and Breastfeeding 4/15/20
29. Preparing for COVID-19: Long-term Care Facilities, Nursing Homes 4/15/20
30. Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease 2019 (COVID-19) 4/15/20
31. Cleaning and Disinfection for Non-emergency Transport Vehicles 4/14/20
32. Guidance for Pharmacies 4/14/20
33. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19) 4/14/20
34. Considerations for School Closure 4/13/20
35. Mitigation Strategies for Communities 4/13/20
36. Strategies to Mitigate Healthcare Personnel Staffing Shortages 4/13/20
37. Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 4/13/20
38. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings 4/12/20
39. Guidance for Child Care Programs that Remain Open 4/12/20
40. COVID-19 and Cooling Centers 4/11/20
41. Running Essential Errands 4/10/20
42. Discontinuation of Isolation for Persons with COVID-19 Not in Healthcare Settings (Interim Guidance) 4/10/20
43. Public Health Activity Guidance 4/09/20
44. Strategies for Optimizing the Supply of N95 Respirators Date: 4/9/20
45. Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 (COVID-19) Date: 4/9/20
46. Decontamination and Reuse of Filtering Facepiece Respirators Date: 4/9/20
47. CDC's role in helping cruise ship travelers during the COVID-19 pandemic Date: 4/9/20
48. Use Personal Protective Equipment when caring for Patients with Confirmed or Suspected COVID Date: 4/8/20
49. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19) Date: 4/8/20
50. Dental Settings Date: 4/8/20
51. COVID-19 Travel Recommendations by Country Date: 4/7/20
52. Guidance for Building Water Systems Date: 4/7/20
53. Outpatient and Ambulatory Care Settings: Responding to Community Transmission of COVID-19 in the United States Date: 4/7/20
54. People with Disabilities Date: 4/7/20
55. Information for Healthcare Professionals: COVID-19 and Underlying Conditions Date: 4/6/20

56. Considerations for Inpatient Obstetric Healthcare Settings Date: 4/6/20
57. Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19) Date: 4/6/20
58. Information for Healthcare Professionals: COVID-19 and Underlying Conditions Date: 4/6/20
59. Operational Considerations for the Identification of Healthcare Workers and Inpatients with Suspected COVID-19 in non-US Healthcare Settings Date: 4/6/20
60. Strategic Priority Infection Prevention and Control Activities for Non-US Healthcare Settings Date: 4/6/20
61. Guidance for Childcare Programs that Remain Open Date: 4/6/20
62. Running Essential Errands Date: 4/6/20
63. Mitigate Healthcare Personnel Staffing Shortages Date: 4/6/20
64. Discontinuation of Isolation for Persons with COVID-19 Not in Healthcare Settings (Interim Guidance) Date: 4/4/20
65. Social Distancing, Quarantine, and Isolation Date: 4/4/20
66. Information for Pediatric Healthcare Providers Date: 4/3/20
67. Human Infection with COVID-19 Person Under Investigation (PUI) and Case Report Form Date: 4/1/20
68. Travelers Returning from International Travel Date: 4/1/20
69. Cleaning and Disinfection for Community Facilities Date: 4/1/20
70. Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings Date: 4/1/20
71. Healthcare Infection Prevention and Control FAQs Date: 4/1/20
72. Considerations for School Closure Date: 3/31/20
73. Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19) Date: 3/31/20
74. Prepare your practice for COVID-19 Date: 3/31/20
75. Travelers Prohibited from Entry to the United States Date: 3/30/20
76. Public Health Recommendations after Travel-Associated COVID-19 Exposure Date: 3/30/20
77. Interim Additional Guidance for Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Outpatient Hemodialysis Facilities
78. Date: 3/30/20
79. Public Health Recommendations for Community-Related Exposure Date: 3/30/20
80. Screening Clients at Entry to Homeless Shelters Date: 3/30/20
81. Phone Advice Line Tool for possible COVID-19 patients Date: 3/30/20
82. Get Your Home Ready Date: 3/27/20
83. Travelers Returning from Cruise Ship and River Cruise Voyages Date: 3/27/20
84. Triage of Suspected COIVD-19 Patients in non-US Healthcare Settings Date: 3/27/20
85. Collection and Submission of Postmortem Specimens from Deceased Persons with Known or Suspected COVID-19, March 2020 (Interim Guidance) Date: 3/25/20
86. Alternate Care Sites and Isolation Sites Date: 3/25/20
87. Mitigation Strategies for Communities Date: 3/24/20

88. Interim guidance for homeless service providers to plan and respond to coronavirus disease 2019 (COVID-19) Date: 3/24/20
89. Interim Guidance for Administrators and Leaders of Community- and Faith-Based Organizations to Plan, Prepare, and Respond to Coronavirus Disease 2019 (COVID-19) Date: 3/23/20
90. Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance) Date: 3/23/20
91. Interim Guidance on Management of Coronavirus Disease 2019 (COVID-19) in Correctional and Detention Facilities
92. Date: 3/23/20|
93. Responding to Coronavirus Disease 2019 (COVID-19) among People Experiencing Unsheltered Homelessness Date: 3/22/20
94. Completing the Person Under Investigation (PUI) and Case Report Form Date: 3/21/20
95. Completing the Person Under Investigation (PUI) and Case Report Form
96. Information for Clinicians on Therapeutic Options for Patients with COVID-19 Date: 3/21/20
97. Information for Clinicians on Therapeutic Options for Patients with COVID-19 Date: 3/21/20
98. Preparing for COVID-19: Long-term Care Facilities, Nursing Homes Date: 3/21/20
99. Information for Health Departments on Reporting Cases of COVID-19 Date: 3/21/20
100. Blood and Plasma Collection Date: 3/21/20
101. Preventing the Spread of COVID-19 in Retirement Communities and Independent Living Facilities (Interim Guidance) Date: 3/20/20
102. Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID-19) Date: 3/20/20
103. Steps Healthcare Facilities Can Take Now to Prepare for Coronavirus Disease 2019 (COVID-19) Date: 3/20/20
104. Strategies to Allocate Ventilators from Stockpiles to Facilities Date: 3/20/20
105. 03/04/2020: Lab Alert: COVID-19 Public Health Reporting for Laboratories that Develop or Use Laboratory Developed Tests with Intent to Obtain EUA Date: 3/20/20
106. 02/18/2020: Lab Advisory: Reminder: COVID-19 Diagnostic Testing Date: 3/20/20
107. Interim Guidance for Administrators of US K-12 Schools and Child Care Programs Date: 3/19/20
108. Interim Guidance for Administrators of US Institutions of Higher Education Date: 3/18/20
109. Pregnancy & Breastfeeding Date: 3/17/20
110. Strategies for Optimizing the Supply of Eye Protection Date: 3/17/20
111. Strategies for Optimizing the Supply of Facemasks Date: 3/17/20
112. Strategies for Optimizing the Supply of Isolation Gowns Date: 3/17/20
113. Global Cruise Ship Travel Health Notice Date: 3/17/20
114. Interim Guidance for Public Health Professionals Managing People With COVID-19 in Home Care and Isolation Who Have Pets or Other Animals Date: 3/16/20

115. Discontinuation of In-Home Isolation for Immunocompromised Persons with COVID-19 (Interim Guidance) Date: 3/16/20
116. Criteria for Return to Work for Healthcare Personnel with Confirmed or Suspected COVID-19 (Interim Guidance) Date: 3/16/20
117. Get Your Mass Gatherings or Large Community Events Ready Date: 3/14/20
118. Evaluating and Testing Persons for Coronavirus Disease 2019 (COVID-19) Date: 3/14/20
119. What Law Enforcement Personnel Need to Know about Coronavirus Disease 2019 (COVID-19) Date: 3/14/20
120. Healthcare Supply of Personal Protective Equipment Date: 3/14/20
121. Interim Guidance for Public Health Personnel Evaluating Persons Under Investigation (PUIs) and Asymptomatic Close Contacts of Confirmed Cases at Their Home or Non-Home Residential Settings Date: 3/14/20
122. Get Your Clinic Ready for Coronavirus Disease 2019 (COVID-19) Date: 3/11/20
123. Recommendations for Election Polling Locations Date: 3/10/20
124. What Healthcare Personnel Should Know about Caring for Patients with Confirmed or Possible COVID-19 Infection Date: 3/10/20
125. Interim Guidance for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points (PSAPs) for COVID-19 in the United States Date: 3/10/20
126. Guidance for Institutions of Higher Education with Students Participating in International Travel or Study Abroad Programs Date: 3/10/20
127. Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease (COVID-19) Date: 3/07/20
128. Disinfecting your home if someone is sick Date: 3/06/20
129. Preventing the Spread of Coronavirus Disease 2019 in Homes and Residential Communities Date: 3/06/20
130. Release of Stockpiled N95 Filtering Facepiece Respirators Beyond the Manufacturer-Designated Shelf Life: Considerations for the COVID-19 Response Date: 3/06/20
131. Interim Guidance: Public Health Communicators Get Your Community Ready for Coronavirus Disease 2019 (COVID-19) Date: 3/01/20
132. Interim Guidance for Healthcare Facilities: Preparing for Community Transmission of COVID-19 in the United States Date: 2/29/20
133. Healthcare Professional Preparedness Checklist for Transport and Arrival of Patients with Confirmed or Possible COVID-19 Date: 2/21/20
134. Interim Guidance for Ships on Managing Suspected Coronavirus Disease 2019 Date: 2/18/20
135. Maritime Resources Date: 2/13/20

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DEFINITIONS[45]

1. Body Mass Index (BMI)-is an indicator of body fatness. Is a person's weight in kilograms divided by the square of height in meters.
2. Acceptable risk - that appears tolerable to some group. Risk that has minimal or long-term detrimental effects or for which the benefits outweigh the potential hazards.
3. Active Workforce - workforce composed of any employee that is not working from home.
4. Acute - a health effect: sudden onset, often brief; sometimes loosely used to mean severe: an exposure: brief, intense, or short-term; sometimes specifically referring to a brief exposure of high intensity. A short term, intense health effect.[46]
5. Acute Respiratory Distress Syndrome (ARDS) - occurs when fluid builds up in the tiny, elastic air sacs (alveoli) in the lungs. The fluid keeps the lungs from filling with enough air, which means less oxygen reaches the bloodstream. This deprives organs of the oxygen they need to function.
6. Age standardization - a procedure for adjusting rates (e.g., death rates) designed to minimize the effects of differences in age composition in comparing rates for different populations
7. Agent - a factor, such as a microorganism, chemical substance, or form of radiation-whose presence, excessive presence, or relative absence is essential for the occurrence of a disease. A disease may have a single agent, a number of independent alternative agents (at least one of which must be present), or a complex of two or more factors whose combined presence is essential for the development of the disease.
8. Antibody - protein molecule produced in response to exposure to a "foreign" or extraneous substance (e.g., invading microorganisms responsible for infection) or active immunization. May also be present as a result of passive transfer from mother to infant, via immune globulin, etc. Antibody has the capacity to bind specifically to the foreign substance (antigen) that elicited its production, thus supplying a mechanism for protection against infectious diseases.
9. Antibody - a protein found in the blood that is produced in response to foreign substances (e.g., bacteria or viruses) invading the body. Antibodies protect the body from disease by binding to these organisms and destroying them.[47]

[45] A Dictionary of Epidemiology, Fifth Edition, Porta et all, Oxford University Press 2008, Available from: http://www.academia.dk/BiologiskAntropologi/Epidemiologi/PDF/Dictionary_of_Epidemiology__5th_Ed.pdf
[46] CDC Vaccines & Immunizations Glossary, Available from : https://www.cdc.gov/vaccines/terms/glossary.html
[47] CDC Vaccines & Immunizations Glossary, Available from : https://www.cdc.gov/vaccines/terms/glossary.html

10. Bacteria - single-celled organisms found throughout nature, which can be beneficial or cause disease.
11. Behavioral Risk Factor - a characteristic or behavior that is associated with increased probability of a specified outcome; the term does not imply a causal relationship
12. Burden of disease - the impact of disease in a population.
13. Carrier - a person or animal harboring a specific infectious agent in the absence of discernible clinical disease and serves as a potential source of infection
14. Case - a particular disease, health disorder, or condition under investigation found in an individual or within a population or study group. As often non-strictly used in the health sciences, a person having a particular disease, disorder, or condition (e.g., a case of cancer, a case in a case-control study). A variety of criteria may be used to identify cases, e.g., individual physicians' diagnoses, registries and notifications, abstracts of clinical records, surveys of the general population, population screening, and reporting of defects, as in a dental record. The epidemiological definition of a case is not necessarily the same as the ordinary clinical definition.
15. Imported Case - in infectious disease epidemiology, a case that has entered a region by land, sea, or air transport, in contrast to one acquired locally.
16. Cleaning - is the removal of visible soil (e.g., organic and inorganic material) from objects and surfaces and normally is accomplished manually or mechanically using water with detergents or enzymatic products.[48]
17. *Coronaviridae* - family of viruses encompasses a group of pathogens with zoonotic potential.
18. Coronavirus - any of a family (*Coronaviridae*) of single-stranded RNA viruses that have a lipid envelope studded with club-shaped projections, infect birds and many mammals including humans, and include the causative agents of MERS, SARS, and CIVID-19.
19. COVID-19 - the name given by the World Health Organization (WHO) on February 11, 2020, for the disease caused by a Novel Coronavirus SARS-COV-2.
20. Concurrent disinfection - is the application of disinfective measures as soon as possible after the discharge of infectious material from the body of an infected person or after the soiling of articles with such infectious discharges, all personal contact with such discharges or articles being minimized prior to such disinfection.
21. Direct Contact Transmission- mode of transmission of infection between an infected host and a susceptible host. Direct contact occurs when skin or mucous surfaces touch, as in shaking hands, kissing, and sexual intercourse.
22. Indirect Contact Transmission - a mode of transmission of infection involving fomites or vectors. Vectors may be mechanical (e.g., fi lth flies) or biological (when the disease agent undergoes part of its life cycle in the vector species).
23. Contagion - the transmission of infection by direct contact, droplet spread, or contaminated fomites.
24. Contagious - transmitted by contact.

[48] CDC Infection Control, Introduction, Methods, Definition of Terms. Available from: https://www.cdc.gov/infectioncontrol/guidelines/disinfection/introduction.html

25. Cumulative death rate - the proportion of a group that dies over a specified time interval. It is the incidence proportion of death.
26. Cumulative incidence, cumulative incidence rate - the number or proportion of a group (cohort) of people who experience the onset of a health-related event during a specified time interval; this interval
27. Data - a collection of items of information.
28. Death rate - an estimate of the portion of a population that dies during a specified period.
29. Determinant - any factor that brings about change in a health condition or other defined characteristic. Single specified causes. A determinant makes a difference to a given outcome.
30. Diagnosis - the process of determining health status and the factors responsible for producing it; may be applied to an individual, family, group, or community.
31. Direct transmission. - direct and essentially immediate transfer of infectious agents to a receptive portal of entry through which human or animal infection may take place. This may be by direct contact such as touching, kissing, biting, or sexual intercourse or by the direct projection (droplet spread) of droplet spray onto the conjunctiva or the mucous membranes of the eyes, nose, or mouth. It may also be by direct exposure of susceptible tissue to an agent in soil, compost, or decaying vegetable matter or by the bite of a rabid animal.
32. Disease - is the biological dimension of nonhealth, an essentially physiological dysfunction.
33. Disinfection - the killing of infectious agents outside the body by direct exposure to chemical or physical agents.
34. Dose - the amount of a substance available for interaction with metabolic processes or biologically significant receptors after crossing the relevant boundary (epidermis, gut, respiratory tract); the absorbed dose is the amount crossing a specific absorption barrier.
35. Effect the result of a cause.
36. Environment - all that which is external to the individual human host. Can be divided into physical, biological, social, cultural, etc., any or all of which can influence the health status of populations.
37. Epidemic - the occurrence in a community or region of cases of an illness, specific health-related behavior, or other health-related events clearly in excess of normal expectancy
38. Etiology - the science of causes, causality; in common usage, cause.
39. Evaluation - a process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in the light of their objectives.
40. Exposed- in epidemiology, the exposed group (or simply, the exposed) is often used to connote a group whose members have been exposed to a supposed cause of a disease or health state of interest or possess a characteristic that is a determinant of the health outcome of interest

41. Factor - an event, characteristic, or other definable entity that leads to a change in a health condition or other defined outcome.
42. Guidelines - a formal statement about a defined task or function.
43. Heating, Ventilation, and Air Conditioning (HVAC) - the systems, machines, and technologies used in indoor settings such as homes, offices, and hallways, and transportation systems that need environmental regulation to improve comfort.
44. Host - a person or other living animal, including birds and arthropods, that affords subsistence or lodgment to an infectious agent under natural conditions. Some protozoa and helminths pass successive stages in alternate hosts of different species. Hosts in which the parasite attains maturity or passes its sexual stage are primary or definitive hosts; those in which the parasite is in a larval or asexual state are secondary or intermediate hosts. A transport host is a carrier in which the organism remains alive but does not undergo development.
45. Hygiene - The principles and laws governing the preservation of health and their practical application. Practices conducive to good health.
46. Acquired Immunity - Resistance acquired by a host as a result of previous exposure to a natural pathogen or foreign substance for the host, e.g., immunity to measles resulting from a prior infection with measles virus
47. Active Immunity - developed in response to stimulus by an antigen (infecting agent or vaccine) and usually characterized by the presence of antibody produced by the host.
48. Natural Immunity- Species-determined inherent resistance to a disease agent, e.g., resistance of humans to the virus of canine distemper.
49. Passive Immunity- Immunity conferred by an antibody produced in another host and acquired naturally by an infant from its mother or artificially by administration of an antibody-containing preparation (antiserum or immune globulin).
50. Specific Immunity - A state of altered responsiveness to a specific substance acquired through immunization or natural infection. For certain diseases (e.g., measles, chickenpox), this protection generally lasts for the life of the individual.
51. Immunity - Protection against a disease.
52. Incidence - The number of instances of illness commencing, or of persons falling ill, during a given period in a specified population. More generally, the number of new health-related events in a defined population within a specified period of time. It may be measured as a frequency count, a rate, or a proportion.
53. Incidence rate- The rate at which new events occur in a population.
54. Incubation period - The time interval between invasion by an infectious agent and appearance of the first sign or symptom of the disease in question
55. Index - a rating scale, e.g., a set of numbers derived from a series of observations of specified variables.
56. Indirect transmission - Vehicle-borne: Contaminated inanimate material or objects (fomites) such as toys, handkerchiefs, soiled clothes, bedding, cooking or eating utensils, and surgical instruments or dressings (indirect contact); water, food, milk; biological products including blood, serum, plasma, tissues, or organs; or any substance serving as an intermediate means by which an infectious agent is transported and introduced into

a susceptible host through a suitable portal of entry. The agent may or may not have multiplied or developed in or on the vehicle before being transmitted.

57. Infection - The entry and development or multiplication of an infectious agent in the body of man or animals
58. Isolation- Separation, for the period of communicability, of infected persons or animals from others under such conditions as to prevent or limit the transmission of the infectious agent from those infected to those who are susceptible or who may spread the agent to others.
59. Middle East Respiratory Syndrome - (MERS) is an illness caused by a coronavirus called Middle East Respiratory Syndrome Coronavirus (MERS-CoV). Most MERS patients developed severe respiratory illness with symptoms of fever, cough, and shortness of breath.
60. Monitoring- The intermittent performance and analysis of measurements aimed at detecting changes in the health status of populations or in the physical or social environment.
61. Multiple risk- Where more than one risk factor for the development of a disease or other outcome is present and their combined presence results in an increased risk, we speak of "multiple risk." The increased risk may be due to the additive effects of the risks associated with the separate risk factors, or to synergism
62. N95 Respirator - A respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles. The 'N95' designation means that when subjected to careful testing, the respirator blocks at least 95 percent of very small (0.3 micron) test particles. If properly fitted, the filtration capabilities of N95 respirators exceed those of face masks. However, even a properly fitted N95 respirator does not completely eliminate the risk of illness or death.[49]
63. Negative study - Often taken to mean a study that fails to find evidence for an effect.
64. Non-Pharmaceutical Interventions - are actions, apart from getting vaccinated and taking medicine, that people and communities can take to help slow the spread of illnesses
65. Novel Coronavirus - A novel coronavirus is a new coronavirus that has not been previously identified.
66. Occurrence - In epidemiology, a general term describing the frequency of a disease or other attribute or event in a population; it does not distinguish between incidence and prevalence. The term is also used to allude to processes that lead to disease or that influence the incidence of disease.
67. Outbreak - An epidemic limited to localized increase in the incidence of a disease, e.g., in a village, town, or closed institution; upsurge is sometimes used as a euphemism for outbreak.
68. Pandemic - An epidemic occurring worldwide or over a very wide area, crossing international boundaries, and usually affecting a large number of people

[49] N95 respirators and Surgical masks, Available from :https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks#s1

69. Parasite - An animal or vegetable organism that lives on or in another and derives its nourishment therefrom.
70. Pathogen - An organism capable of causing disease.
71. Population - All the inhabitants of a given country or area considered together; the number of inhabitants of a given country or area
72. Population attributable risk (PAR) - This term is sometimes used as a synonym for attributable fraction (population). It is also used for the difference of the population rate or risk of disease and the rate or risk in the unexposed.
73. Person Under Investigation (PUI) - Any person who is currently under investigation for having the virus that causes COVID-19, or who was under investigation but tested negative for the virus
74. Polymerase Chain Reaction (PCR) test - laboratory method to detect microbial pathogens in clinical specimens, used when pathogens are difficult to culture in vitro or. Require a long cultivation period.
75. Public Health Emergency of International Concern - is an extraordinary event which is determined, to constitute a public health risk to other States through the international spread of disease; and, to potentially require a coordinated international response. It implies a situation that is serious, unusual or unexpected; carries implications for public health beyond the affected State's national border; and may require immediate international action[50].
76. Prevalence - The number of disease cases (new and existing) within a population over a given period. A measure of disease occurrence: the total number of individuals who have an attribute or disease at a particular time (it may be a particular period) divided by the population at risk of having the attribute or disease at that time or midway through the period.
77. Prevention- Actions that prevent disease occurrence. Actions aimed at eradicating, eliminating, or minimizing the impact of disease and disability, or if none of these is feasible, retarding the progress of disease and disability.
78. Quantiles - Divisions of a distribution into equal, ordered subgroups.
79. Quarantine- Restriction of the activities of well persons or animals who have been exposed to a case of communicable disease during its period of communicability (i.e., contacts) to prevent disease transmission during the incubation period if infection should occur.
80. Real-time RT- polymerase chain reaction (rRT-PCR) test - test for the detection of the SARS-CoV-2 virus (the virus that causes COVID-19) in respiratory specimens.
81. Relative risk - the number of events in a group divided by the total number of subjects in that group.
82. Ribonucleic Acid - (RNA) is one of the three major biological macromolecules that are essential for all known forms of life (along with DNA and proteins).
83. Risk - The probability that an event will occur, e.g., that an individual will become ill or die within a stated period of time or by a certain age.

[50] WHO, Strengthening health security by implementing International Health Regulations (2005) Available from: https://www.who.int/ihr/procedures/pheic/en/

84. Risk assessment - The qualitative or quantitative estimation of the likelihood of adverse effects that may result from exposure to specified health hazards or from the absence of beneficial influences. Risk assessment uses clinical, epidemiologic, toxicologic, environmental, and any other pertinent data. The process of determining risks to health attributable to environmental or other hazards. The process consists of four steps: Hazard identification: Identifying the agent responsible for the health problem, its adverse effects, the target population, and the conditions of exposure. Risk characterization: Describing the potential health effects of the hazard, quantifying dose-effect and dose-response relationships. Exposure assessment: Quantifying exposure (dose) in a specified population based on measurement of emissions, environmental levels of toxic substances, biological monitoring, etc. Risk estimation: Combining risk characterization, dose-response relationships, and exposure estimates to quantify the risk level in a specific population. The end result is a qualitative and quantitative statement about the health effects expected and the proportion and number of affected people in a target population, including estimates of the uncertainties involved. The size of the exposed population must be known.
85. Risk factor- An aspect of personal behavior or lifestyle, an environmental exposure, or an inborn or inherited characteristic that, on the basis of scientific evidence, is known to be associated with meaningful health-related condition(s).
86. Risk management- The steps taken to alter (i.e., reduce) the levels of risk to which an individual or a population is subject. The managerial, decision-making, and active hazard control process to deal with environmental agents of disease, such as toxic substances, for which risk evaluation has indicated an unacceptably high level of risk. The process consists of three steps: 1. Risk evaluation: Comparison of calculated risks or public health impact of exposure to an environmental agent with the risks caused by other agents or societal factors and with the benefits associated with the agent as a basis for deciding what is an acceptable risk. 2. Exposure Control: Actions taken to keep exposure below an acceptable maximum limit. 3. Risk Monitoring: The process of measuring reduction in risk after exposure control actions have been taken in order to reassess risks and initiate further control measures if necessary
87. Severe Acute Respiratory Syndrome (SARS)- a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV).
88. Serology Test - a test that measures the number of antibodies or proteins present in the blood when the body is responding to a specific infection, like COVID-19.
89. Social Distancing Measures - Measures that aim to reduce the frequency of contact and increase the physical distance between persons, thereby reducing the risks of person-to-person transmission[51].
90. Strategy- In public health, a set of essential measures (e.g., social, sanitary, environmental) proven to be effective or efficient to control a health problem.

[51] Nonpharmaceutical Measures for Pandemic Influenza in Nonhealthcare Settings—Social Distancing Measures , Volume 26, Number 5—May 2020

91. Surgical mask- is a loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment[52]
92. Surveillance -Systematic and continuous collection, analysis, and interpretation of data, closely integrated with the timely and coherent dissemination of the results and assessment to those who have the right to know so that action can be taken. It is an essential feature of epidemiological and public health practice.
93. Sustainability - The ability to continue economic, social, cultural, and environmental aspects of human society and the nonhuman environment
94. Terminal disinfection- is the application of disinfective measures after the patient has been removed by death or to a hospital, or has ceased to be a source of infection, or after other hospital isolation practices have been discontinued. Terminal disinfection is rarely practiced; terminal cleaning generally suffices, along with airing and sunning of rooms, furniture, and bedding. Disinfection is necessary only for diseases spread by indirect contact; steam sterilization or incineration of bedding and other items is desirable after a disease such as plague or anthrax.
95. Transmission of infection- Any mechanism by which an infectious agent is spread from a source or reservoir to another person.
96. Universal precautions- Procedures to be followed when health workers anticipate the possibility of infection by a patient who may harbor a highly contagious, dangerous pathogen. Universal precautions may include segregation of the patient in a private room; use of gloves, gown, mask, Perspex shield (eye protection); and rigorous attention to ensuring that no blood or other body fluid from such a patient can come into contact with the skin or mucous membranes of the health care worker
97. Virus - A microorganism composed of a piece of genetic material (RNA or DNA) surrounded by a protein coat. To replicate, a virus must infect a living cell. Viruses can reproduce only by entering a host cell and using the translational system of the cell to initiate the synthesis of viral proteins and to undergo replication.
98. Zoonosis- An infection or infectious disease transmissible under natural conditions from vertebrate animals to humans. Examples include rabies and plague.

ACRONYMS

1. ARDS: Acute Respiratory Distress Syndrome
2. BMI: Body Mass Index
3. CDC: Centers for Disease Control and Prevention
4. COVID-19: Coronavirus Disease of 2019
5. EUA: Emergency Use Utilization
6. EPA: Environmental Protection Agency
7. FDA: Food and Drug Administration

[52] N95 respirators and Surgical masks, Available from :https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks#s1

8. GDP Gross domestic product.
9. HVAC: Heating, Ventilation and Air Conditioning
10. JOCIP: Joint Operational Catastrophic Incident Plan
11. NIH National Institutes of Health (United States)
12. NIOSH National Institute for Occupational Safety and Health (United States) (www.niosh. gov).
13. NPI's: Non-Pharmaceutical Interventions
14. OSHA: Occupational Safety and Health Administration
15. PAR: Population Attributable Risk
16. PCR: Polymerase Chain Reaction
17. PROSHA: Puerto Rico Occupational Safety and Health Administration
18. PUI: Person Under Investigations
19. rRT-PCR: Real-time polymerase chain reaction
20. RNA: Ribonucleic Acid
21. SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2
22. WHO: World Health Organization

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SUMMARY OF CHANGES

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