



VRHealthLeaders

Coursebook

Erasmus+ Programme

2014-2020

Key Action 2: Strategic Partnership

**A Multifaceted VR Learning Platform for Future Healthcare
Leaders (2021-2023)**

Agreement N° 2020-1-CY01-KA226-HE-082726

IO6 Coursebook

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Introduction to the Course

Leadership skills are required now more than ever. Health professionals are dealing with constant changes to both the systems they work in and the patients they serve. Such changes, coupled with large scale public health crises, indicate it is crucial to equip the health workforce with the skills to deal with pressures healthcare systems face. This training course uses virtual reality to increase the leadership capabilities of future healthcare managers and policy makers using public health crises as the key theme of the training programme. Using virtual reality as a primary tool for leadership training improves healthcare systems by broadening the experiences of healthcare leaders thus providing better outcomes, services and quality to patients across the EU and the globe.

This course presents a clear approach for integrating the principles of leadership and management along with core attributes needed to lead through an emerging public health crisis. Using the Covid-19 pandemic as the cornerstone of the course, learners will experience six scenarios all tailored to experiential learning of leadership competencies and domains (outlined below). By clarifying the leadership attributes and providing specific real-world case studies for implementing such principles in healthcare practice, this course provides a compelling example of how better leadership can improve healthcare systems.

The course consists of the following modules:

- Module 1: Scene Setting (Introduction)
- Module 2: Emergency Control Room
- Module 3: Media Press Conference
- Module 4: Ward Visit
- Module 5: Inter-Organisational Meeting
- Module 6: Vaccine Hesitancy

The following competencies of learners are to be assessed throughout the curriculum:

- Communication
- Assertiveness
- Emotional Resilience
- Conflict Resolution
- Teamwork
- Emotional Values
- Decision-Making
- Leadership

The pedagogical approach to leadership dimensions and qualities corresponds to the Healthcare Leadership Domains developed by Storey and Holti (2013). These domains include:

- Inspiring shared purpose
- Leading with care
- Evaluating information
- Connecting our service
- Sharing the vision
- Engaging the team
- Holding to account
- Developing capability
- Influencing for results

The remainder of the coursebook outlines the modules in detail, including the key areas covered, teaching methods, and learning outcomes.

Module 1: Scene Setting

<p>Module Summary</p> <p>This module outlines the premise for the entire simulation. It provides background information which is key for the learner to understand their role in the training course and general learning experience. The module demonstrates the close connection between a healthcare leader and their environment in wider society as well as their responsibilities to their employer and the role they play in the organisation.</p> <p>Key areas covered</p> <ul style="list-style-type: none"> • Scene setting and background information • Understanding of wider contextual factors of leadership roles • Basic elements of leadership skills and attributes 	<p>Importance of the module to healthcare delivery</p> <p>This module provides key context to ensure that the training course is provided within the boundaries of the participants’ professional discipline, personal experiences, and within a relevant healthcare setting. This ensures the authenticity of the simulation so that the learning context is close to the context of practice, thus creating a better and more realistic learning experience. This heightened learning experience will ensure that core educational objectives in other modules are understood and upon completion transferred to healthcare delivery.</p> <p>Importance of the module to individual healthcare professionals</p> <p>This module uses situated learning as a framework for delivering a simulated, life-like experience to learners. Using both virtual reality and other interactive media sources, therefore requires the integration of familiar context that is easily recognised and understood by those taking part in the simulation. Scene setting provides context to the healthcare professionals, enabling them to greater understand the learning objects and leadership skills highlighted in further modules.</p>
<p>Teaching methods</p> <p>In person education, online teaching, blended learning, autonomous learning.</p>	
<p>Essential questions</p> <ul style="list-style-type: none"> • What are the key attributes of leadership and management? • What is my role within the training course and simulation? • What will the training course and simulation entail? • What are the core learning outcomes for the training course? 	<p>Learning outcomes</p> <p>Successful completion of the module will lead to:</p> <ul style="list-style-type: none"> • An understanding of the wider concept leadership of humanism • An understanding of the role that healthcare leaders have within healthcare systems and hospitals • The key attributes of leadership and core skills required for leadership development • Greater understanding of the next steps that will be taken in the training course.
<p>Key module resources</p>	

McGrath, J. Taekman, M. Dev, P. Danforth, D. Mohan, D. Kman, N. Crichlow, A. Bond, W., Simulation Environments to Assess Competence for Emergency Medicine Learners, *Academic Emergency Medicine* 2018, 25: 186–195

Motola I, Devine LA, Chung HS, Sullivan JE, Issenberg SB. Simulation in healthcare education: a best evidence practical guide. *AMEE Guide No. 82. Med Teach.* 2013 Oct;35(10):e1511-30

Salas E, T Paige J, Rosen MA. Creating new realities in healthcare: the status of simulation-based training as a patient safety improvement strategy, *BMJ Qual Saf* 2013; 22:449–452.

Sørensen JL, Navne LE, Martin HM, Ottesen B, Albrechtsen CK, Pedersen BW, Kjærgaard H, van der Vleuten C. Clarifying the learning experiences of healthcare professionals with in situ and off-site simulation-based medical education: a qualitative study. *BMJ Open.* 2015 Oct 6;5(10):e008345

Module 2: Emergency Control Room

<p>Module Summary</p> <p>This Module provides a scenario where a healthcare leader has been asked by the hospital CEO to manage an emergency control room for a health care service provider. The scenario takes place in a hospital setting, equipped with multiple health systems, supporting patients going through different health care issues.</p> <p>Key areas covered</p> <ul style="list-style-type: none"> • Provide guidance on how to manage crisis situations within an emergency setting, where everything and everyone needs support but prioritisation is a must to ensure an on time and effective delivery • Align on the importance of ensuring that policies and procedures are adhered to, in order to ensure that patient safety is not being compromised. 	<p>Importance of module to healthcare delivery</p> <p>This module supports providing skills to the healthcare workforce in general to be able to understand the patient needs and ensure they are being addressed in a timely manner without adversely impacting the operation.</p> <p>Importance of module to individual healthcare professionals</p> <p>This module is important to support the development of improved communication skills in order to clearly communicate support needs and patient requirements. Facilitating the understanding of a complex situation where quick decision making is a must and risks are high is of huge benefit to health care professionals within an emergency setting.</p> <p>The importance of adhering to public health policies and procedures without putting patients at risk and without compromising efficiency in service delivery is a long-term benefit even for newly onboarded personnel. Establishing processes which can be cascaded to the respective teams to support with training and onboarding of new health care professionals in the emergency control room setting supports a more reliable and consistent system.</p>
<p>Teaching methods</p> <p>In person education, online teaching, blended learning, autonomous learning.</p>	
<p>Essential questions</p> <ul style="list-style-type: none"> • What are the key attributes of a healthcare professional who can manage multiple requests within an emergency setting? • Why is it important for health leaders to understand the procedures within an emergency control room? • How are multiple scenarios prioritised at any point in time? How does consultation and adherence to policy support with addressing emergency situations in the right manner? • How can healthcare professionals communicate health information to high- 	<p>Learning outcomes</p> <p>Successful completion of the module will lead to:</p> <ul style="list-style-type: none"> • Increased confidence levels to manage crisis in emergency situations • Improved decision-making skills to determine prioritisation of multiple requirements • Increased level of communication and understanding between personnel within an emergency setting • Manage conflicting directions and requests coming through whilst ensuring the sufficient support is being given to the people in need • Retaining the focus on the delivery

<p>risk patients who are emotionally driven and in a high-risk situation?</p>	
<p>Key course resources</p> <p>Chichester District Council. (2016). Emergency Control Centre: Setup and Operational Guidance. Version 5 .2. . Retrieved February 4, 2023, from: https://www.chichester.gov.uk/media/27325/Emergency-Control-Centre-Setup-and-Operational-Guidance/pdf/Redacted_CDC_Emergency_Control_Centre_Setup_and_Operational_Guidance_April_2016.pdf</p> <p>ETKHO. (n.d). Operation of a surgery control room: key safety devices in supervision. ETKHO Hospital Engineering Inc. Retrieved February 1, 2023, from: https://www.etkho.com/en/operation-of-a-surgery-control-room-key-safety-devices-in-supervision/</p> <p>Kausar, M. Hospital administration control room: An effective concept for managing hospital operation issues: A study in tertiary care public sector hospital. Research Foundation of Hospital and Healthcare Administration, 82. Retrieved February 6 from: https://www.jrfhha.com/doi/JRFHHA/pdf/10.5005/jp-journals-10035-1097</p>	

Module 3: Media Press Conference

<p>Module Summary</p> <p>Effectively communicating with the media is an essential learned skill, for any healthcare leader, that requires training and practice. This module provides a scenario where a healthcare leader has been asked by the hospital CEO to meet the local TV and printed press media. The scenario takes place with multiple news correspondents asking challenging questions. The response to each question/answer triggers further questions/follow ups. A 'public satisfaction' and 'political satisfaction' score based on the student's response to questions is given at the end. The module underlines the importance of communication during public health emergencies and ensuring that organisational and national policy is communicated effectively. Through successful media communication, healthcare leaders can engage the public and help them to make informed and better decisions.</p> <p>Key areas covered</p> <ul style="list-style-type: none"> • Present factual and specific information to the wider general population. • Understand how to convey information as a component of outbreak surveillance. • Communicate public health information to non-scientific audiences. 	<p>Importance of the module to healthcare delivery</p> <p>Communicating via a media press conference is an important element in effective emergency management. Therefore, effective media communication might result in greater public resilience and guide appropriate public participation to support the containment of an outbreak. In addition, efficient media communication can be considered as one tool to bring an outbreak under control as quickly as possible, with as little social disruption as possible. Overall, media communication establishes public confidence in the ability of healthcare professionals to deal with an emergency, and to bring about a satisfactory conclusion.</p> <p>Importance of the module to individual healthcare professionals</p> <p>This module will help future healthcare leaders to develop their communication skills in order to handle mass media with confidence and in an efficient way. Healthcare professionals have an important responsibility to promote the practice of public health. Therefore, healthcare leaders should communicate health information in such a way that it can be interpreted appropriately by mass media, individuals and society. Within the limits of available knowledge, healthcare leaders should be able to bridge the gap between providing relevant information, only presenting information that needs to be known by the target audience and ensuring that they maintain the message that their hospital wishes to present. Healthcare leaders may develop their skills on how to exchange information aimed at eliciting trust and promoting understanding of the specific issues.</p>
<p>Teaching methods</p> <p>In person education, online teaching, blended learning, autonomous learning.</p>	
<p>Essential questions</p> <ul style="list-style-type: none"> • What are the key attributes of effective communication with mass media? • Why is it important for health leaders to provide timely and accurate information 	<p>Learning outcomes</p> <p>Successful completion of the module will lead to:</p> <ul style="list-style-type: none"> • A greater level of self-confidence on how to respond to mass media.

<p>of an emerging health crisis to the mass media?</p> <ul style="list-style-type: none"> • How can healthcare professionals communicate health information to non-scientific audiences? • Why is interaction with journalists is essential for healthcare delivery? 	<ul style="list-style-type: none"> • An understanding on how to convey health information to different users. • Enrichment of knowledge on how to disseminate information in order to mitigate an emerging health crisis.
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Key module resources

Glik, D. C. (2007). Risk communication for public health emergencies. *Annual review of public health*, 28, 33.

Regidor, E., de la Fuente, L., Gutiérrez-Fisac, J. L., de Mateo, S., Pascual, C., Sánchez-Payá, J., & Ronda, E. (2007). The role of the public health official in communicating public health information. *American journal of public health*, 97(Supplement_1), S93-S97.

World Health Organization. (2005). *Effective media communication during public health emergencies: a WHO field guide* (No. WHO/CDS/2005.31 a). World Health Organization.

Module 4: Ward Visit

<p>Module Summary</p> <p>This module provides the learner with the opportunity of getting to some of the challenges and difficulties that can occur during a realistic ward visit. During this VR-interactive experience, the learner will be able to move, communicate and interact with key healthcare stakeholders freely. The learner will also be asked to make decisions that will support other healthcare professionals, patients, and their relatives via a set of questions, each representing a different major aspect of the pandemic as faced on a real life-case scenario. The student will only be able to ask a limited number of questions which simulates the hectic nature of a real-life ward and the busy healthcare professionals that work in them.</p> <p>Key areas covered</p> <ul style="list-style-type: none"> • Decision making during a crisis in a specific healthcare environment (hospital ward). • Engagement with practitioners to better understand the needs of the patients and the healthcare professionals. 	<p>Importance of the module to healthcare delivery</p> <p>This module deals with the difficulties that can occur due to the increased patient flows in demanding crises, such as the staff burnout, retention, increased working hours, etc. The importance of the module is highlighted by its authenticity, since it provides a scenario that can be useful in the case that another healthcare crisis arises in the years to come. Additionally, given that it enables the learner to identify aspects of the clinical practice that are not usually given as much attention, this module provides a unique hands-on experience in crucial healthcare delivery, aspects that may affect decision making and leadership.</p> <p>Importance of the module to individual healthcare professionals</p> <p>The content of this module can be particularly useful to healthcare professionals working in hospital wards in a leadership capacity. The module provides them with the opportunity to enhance their knowledge regarding the organisation, utilization, and delivery of the enormous amount of information related to the diagnosis, support, and treatment of COVID-19 infected patients. Additionally, via the simulation of the ward in an interactive VR environment, each learner can find ways to optimize the provided healthcare services by redoing the module and reviewing the outcomes of each selected strategy.</p>
<p>Teaching methods Interactive Virtual Reality (VR), in person, online, autonomous learning</p>	
<p>Essential questions</p> <ul style="list-style-type: none"> • What are the key requirements of healthcare practitioners? • How can healthcare leaders optimise the limited time with healthcare practitioners? • What data is already known and how can new information be elicited? • What specific information will each professional group have expert knowledge of? 	<p>Learning outcomes</p> <p>Successful completion of the module will lead to:</p> <ul style="list-style-type: none"> • Enhancement of emotional resilience during harsh conditions • Evaluation of conflicting and/or variable information deriving from different sources during a crisis • Team engagement in patients' treatment from different professionals

	<ul style="list-style-type: none"> • Cultivation of empathy among colleagues through the identification of conditions such as the staff burnout
<p>Key course resources</p> <p>Leong, S. L., Parascando, J. A., VanDyke, E., Anderson, A., Kass, L., Grana, J., & Messner, E. (2022). Creating Virtual Learning for 3-Year Accelerated MD Students During the COVID Pandemic. <i>PRiMER (Leawood, Kan.)</i>, 6, 33. https://doi.org/10.22454/PRiMER.2022.422339</p> <p>Mill, T., Parikh, S., Allen, A., Dart, G., Lee, D., Richardson, C., Howell, K., & Lewington, A. (2021). Live streaming ward rounds using wearable technology to teach medical students: a pilot study. <i>BMJ simulation & technology enhanced learning</i>, 7(6), 494–500. https://doi.org/10.1136/bmjstel-2021-000864</p> <p>Pottle, J. (2019). Virtual reality and the transformation of medical education. <i>Future healthcare journal</i>, 6(3), 181. DOI: 10.7861/fhj.2019-0036</p> <p>Ray, J. M., Wong, A. H., Yang, T. J., Buck, S., Joseph, M., Bonz, J. W., Auerbach, M. A., Couturier, K., Tomassoni, A. J., Schwartz, M. L., & Evans, L. V. (2021). Virtual Telesimulation for Medical Students During the COVID-19 Pandemic. <i>Academic medicine : journal of the Association of American Medical Colleges</i>, 96(10), 1431–1435. https://doi.org/10.1097/ACM.0000000000004129</p> <p>Rydel, T. A., Bajra, R., & Schillinger, E. (2021). Hands Off Yet All In: A Virtual Clerkship Pilot in the Ambulatory Setting During the COVID-19 Pandemic. <i>Academic medicine : journal of the Association of American Medical Colleges</i>, 96(12), 1702–1705. https://doi.org/10.1097/ACM.0000000000004127</p> <p>Sukumar, S., Zakaria, A., Lai, C. J., Sakumoto, M., Khanna, R., & Choi, N. (2021). Designing and Implementing a Novel Virtual Rounds Curriculum for Medical Students' Internal Medicine Clerkship During the COVID-19 Pandemic. <i>MedEdPORTAL : the journal of teaching and learning resources</i>, 17, 11106. https://doi.org/10.15766/mep_2374-8265.11106</p> <p>Wang, J. J., Lavigueur, O., Sheridan, M., & Stern, E. (2017). Implementation of a simulation-based telemedicine curriculum. <i>Medical education</i>, 51(11), 1178–1179. https://doi.org/10.1111/medu.13433</p>	

Module 5: Inter-Organisational Meeting

<p>Module Summary</p> <p>This module presents a simulation of an inter-organisational meeting for Covid-19 strategic planning policy. As part of this simulation, you are a Hospital Leader who has been asked to attend a meeting to implement a new policy, in response to the proposed Covid-19 Strategic Planning Policy, which has been developed by your hospital. Within this module, the learner will be able to select which policy item to start the meeting with:</p> <ul style="list-style-type: none"> • Health workforce issues • Risk management • Operational policy • Planning and Forecasting <p>According to the learners' selection, a score based on the student's response to questions is given at the end.</p> <p>Key areas covered</p> <ul style="list-style-type: none"> • Risk management in terms of being aware of the risk of the pandemic to the healthcare system, the control measures taken (Strategic Planning Policy) and their impact. • Operational policy in terms of impact of the Strategic Planning Policy in the care delivery and patients' expectations, as well as the cost associated to these measures. • Health workforce issues in terms of staff secondments, staff being duly informed, and their engagement. • Planning and forecasting in terms of how the agreed measures within the Strategic Planning Policy are going to be presented to the general population and their expected acceptance. 	<p>Importance of the module to healthcare delivery</p> <p>This module provides an overview of the key elements that must be considered in strategic planning within a hospital in demanding crises. Among those key elements, the organisation of the risk management for the institution, the workforce and the patients are essential to provide an efficient healthcare delivery during a crisis. In addition, the management of the costs related to both the crisis and the measures/policies implemented. Finally, patients and workforce expectations, which may have also an impact on healthcare delivery, are also addressed within this module.</p> <p>Importance of the module to individual healthcare professionals</p> <p>The module provides to healthcare leaders, in particular hospital leaders, an overview of the different elements that they must consider when dealing with a public health crisis. Healthcare leaders should be able to make informed decisions when designing or agreeing on measures and policies to face a crisis, by knowing the importance and potential repercussions of the situation. In addition, they ought to efficiently manage workforce resources by engaging all stakeholders in the decisions, considering staff secondments. Moreover, healthcare leaders must estimate accurately the associated costs to the agreed measures and policies, and the expectations. Finally, they should know how to effectively communicate the agreed measures and policies to a wider audience.</p>
<p>Teaching methods</p> <p>In-person education, online teaching, blended learning, autonomous learning.</p>	
<p>Essential questions</p> <ul style="list-style-type: none"> • What are the key elements that health leaders must consider for strategic planning in response to a public health crisis? 	<p>Learning outcomes</p> <p>Successful completion of the module will lead to:</p> <ul style="list-style-type: none"> • An increase in the leadership capabilities of future healthcare managers and policy makers using public health crises.

<ul style="list-style-type: none"> • What is the potential impact of the crisis and how to address it efficiently? • What measures are already taken and how can new measures/policies be deployed and presented within the organisation and to the general public? 	<ul style="list-style-type: none"> • An understanding of how strategic planning works, including the different elements involved: risk management, workforce management, operational policy and planning and forecasting the policy. • A greater level of self-confidence on how to deal with strategic planning policy for a public health crisis.
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Key course resources

Aunger, J.A., Millar, R., Greenhalgh, J. et al. (2021). Why do some inter-organisational collaborations in healthcare work when others do not? A realist review. *Syst Rev*, 10, 82.

Brand SL, Thompson Coon J, Fleming LE, Carroll L, Bethel A, Wyatt K. (2017). Whole-system approaches to improving the health and wellbeing of healthcare workers: A systematic review. *PLoS ONE*, 12.

Clements C, Barsamian J, Burnham N, Cruz C, Darcy AMG, Duphiney L, FitzGerald J, Holland S, Joyce C, DeSanto-Madeya S. (2021). Supporting Frontline Staff During the COVID-19 Pandemic. *Am J Nurs*, 121(9):46-55.

Folkman AK, Tveit B, Sverdrup S. (2019). Leadership in interprofessional collaboration in health care. *J Multidiscip Healthc*, 30;12:97-107.

Glenn I. Haw, E. Graham, B. Coates, D. Duncan, T. Wilson, R. Crouch, S., (2015). Agent-based simulation of emergency response to plan the allocation of resources for a hypothetical two-site major incident *Engineering Applications of Artificial Intelligence*, 46, Part B, 336-34.

NHS Leadership Academy. (2013). *The Healthcare Leadership Model, version 1.0*, Leeds: NHS Leadership Academy.

Nicola M, Sohrabi C, Mathew G, et al. (2020). Health policy and leadership models during the COVID-19 pandemic: A review. *Int J Surg*, 81:122-129.

Warraich S, Olabi B, Azhar B, Tanzeem SF, Fischer M. (2020). Medical leadership in the NHS during the COVID-19 pandemic. *Br J Hosp Med (Lond)*, 2;81(6):1-3.

Module 6: Vaccine Hesitancy

<p>Module Summary</p> <p>A number of scenarios featuring members of the public who are vaccine hesitant will be presented to the students. After each scenario, additional information will be provided, and the students will be asked to identify the correct policy implementation that would help to reduce or eliminate the risk of vaccine hesitancy. The policy implementations will be aimed at micro, meso, and macro levels (such as one-on-one consultation, hospital level, and countrywide implementation). A conceptual model of Vaccine Hesitancy will be used, comprising the following factors that may impact vaccine acceptance: perceived importance of vaccination, risk perception and trust, misconceptions and misinformation, religious and moral convictions, subjective norms, and past experiences</p> <p>Key areas covered</p> <ul style="list-style-type: none">• Examine possible causes that lead to vaccine hesitancy• Investigate what can be done to tackle the factors which are related with reluctance to vaccination• Lead with care and connect your service	<p>Importance of module to healthcare delivery</p> <p>Vaccine hesitancy can have significant public health consequences, as it can contribute to the spread of vaccine-preventable diseases. By addressing vaccine hesitancy can help to build public trust in vaccines and the healthcare system more broadly. This can help to promote the importance of vaccination as a crucial component of disease prevention. Therefore, by improving vaccine uptake and reducing the incidence of vaccine-preventable diseases, the module can help to enhance public health outcomes. Furthermore, vaccine-preventable diseases can be costly for both patients and the healthcare system, and reducing the incidence of these diseases through increased vaccination can help to reduce healthcare costs. In conclusion, this course can be an important tool for the healthcare system in addressing vaccine hesitancy, improving vaccine uptake, and promoting overall health and wellbeing.</p> <p>Importance of module to individual healthcare professionals</p> <p>The content of this module can be particularly useful for healthcare professionals to train them on the '3 Cs' model (confidence, complacency, convenience), which was developed by the SAGE Working Group to map three main factors that influence vaccine uptake (WHO, 2014). Addressing vaccine hesitancy requires a multifaceted approach that involves addressing individual concerns and misconceptions, strengthening vaccine confidence and trust, and improving access to and delivery of vaccines. This course might improve healthcare professionals' understanding of vaccine hesitancy and equip them with the knowledge they need to address concerns and questions from patients. In addition, it can help healthcare workers develop communication skills that are effective in addressing vaccine hesitancy. Finally, it may support healthcare providers on how to engage in conversations with patients who may be hesitant about vaccination, explore the reasons behind their hesitancy and tailor their counselling to the specific concerns of each patient.</p>
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Teaching methods

In person education, online teaching, blended learning, autonomous learning and interactive videos.

Essential questions

- What are the key requirements for healthcare practitioners to help patients trust vaccines?
- How can healthcare leaders optimise counselling related to vaccination?
- How can vaccination hesitancy be managed in the most vulnerable target groups?

Learning outcomes

Successful completion of the module will lead to:

- Development of knowledge and skills which will help the healthcare workers to make evidence-based decisions about vaccine recommendations.
- Enhancement of health communication and counselling skills in order to counter resistance to vaccination.
- Advancement of skills on managing conflicting information from different vaccination hesitancy groups.

Key course resources

Al-Amer, R., Maneze, D., Everett, B., Montayre, J., Villarosa, A. R., Dwekat, E., & Salamonson, Y. (2022). COVID-19 vaccination intention in the first year of the pandemic: A systematic review. *Journal of clinical nursing*, 31(1-2), 62-86.

Dror, A. A., Eisenbach, N., Taiber, S., Morozov, N. G., Mizrachi, M., Zigron, A., Srouji, S. & Sela, E. (2020). Vaccine hesitancy: the next challenge in the fight against COVID-19. *European journal of epidemiology*, 35, 775-779.

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. A. (2013). Vaccine hesitancy: an overview. *Human vaccines & immunotherapeutics*, 9(8), 1763-1773.

Dubé, È., Ward, J. K., Verger, P., & MacDonald, N. E. (2021). Vaccine hesitancy, acceptance, and anti-vaccination: trends and future prospects for public health. *Annu Rev Public Health*, 42(1), 175-91.

Kumar, D., Chandra, R., Mathur, M., Samdariya, S., & Kapoor, N. (2016). Vaccine hesitancy: understanding better to address better. *Israel journal of health policy research*, 5, 1-8.

MacDonald NE. (2015). Vaccine hesitancy: definition, scope and determinants. *Vaccine* 33:4161–64

Millward, G. (2018). Stuart Blume, *Immunization: How Vaccines Became Controversial*.

Paterson, P., Meurice, F., Stanberry, L. R., Glismann, S., Rosenthal, S. L., & Larson, H. J. (2016). Vaccine hesitancy and healthcare providers. *Vaccine*, 34(52), 6700-6706.

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Stahl JP, Cohen R, Denis F, Gaudelus J, Martinot A, Lery T, Lepetit H. The impact of the web and social networks on vaccination.

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WHO (2014). Report Of The Sage Working Group On Vaccine Hesitancy

WHO (2019). Ten threats to global health in 2019. World Health Organization News, March 21. <https://www.who.int/vietnam/news/feature-stories/detail/ten-threats-to-global-health-in-2019>

World Health Organization. (2021). Vaccines and immunization: What is vaccination. World Health Organization.