**Summary Information**

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| Project Title: | Julie KL2 |
| PI: | Julie Kong |
| Project Status: | In progress |
| Cycle: | The KL2 Cycle |
| **Mentors:** | Xia Tan; |
| Human Subject Involved?: | Yes |
| Animal Subjects Involved?: | Yes |
| NOA: | fakeNOA |
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**Progress Report Details**

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| Degree(s) Held | 1,2 |
| Degree(s) working toward |  |
| Externship Report | none |
| Mentor Evaluation | ldf;dakf;askf;ladskf;ladsk;lksd;lgkdsl;k;fdskf;dsk;lf;ldskl;;l;klds;ls |
| RFA or information on the grant | jljslsjsdlsajdlkjasdkljdasljdlsjalkdjskaldjklsajlkdjas |
| Number of grant submissions | 1 |
| Publications resulting from the project | none |
| Information on any patents or intellectual property | none |
| Research Summary | lnsldjlsadjlkjlkfjlksafjlkfjlsfjlsfjlkjlas |
| **Research / Scholarly Goals** | |
| Progress Made Towards Goal #1 | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Challenges Encountered Towards Goal #1 | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Plan for Progress and Completion of Goal #1 | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Progress Made Towards Goal #2 | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
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| Additional Goal in the Previous Year |  |
| Research Goal For Next Year | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Career Development Goal | |
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| Progress Made Towards Goal #2 | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
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| Additional Training Goals |  |
| Training Goal For Next Year | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Desc Of Awarded Project | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Desc Of Awardee Role | kfldjflejlfkjdslkafjldksjflsdjlfdsf |
| Coursework | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Conference Presentations | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Fellowships or Other Support | Out-of-hospital cardiac arrest (OHCA) affects approximately 350,000 persons in the United States annually. While advances in resuscitation science have improved survival rates, mortality varies widely by geography. The lethality of OHCA among minority and low income patients in large cities has been extensively described and cannot be fully explained by clinical variables alone. Non-clinical factors may explain up to 28% of the reported variability in outcomes.  Machine Learning (ML) is a sub-field of artificial Intelligence where algorithms can learn and improve themselves by studying high volumes of data. The proposed work will develop a ML model for urban OHCA to identify social determinants of health and environmental factors that predict OHCA outcomes in simulated patient scenarios. The specific aims of this study are: Aim 1. Develop and test a ML model of OHCA survival using data from the Cardiac Arrest Registry to Enhance Survival (CARES) and neighborhood-level data from the Chicago Health Atlas.  Aim 2. Use ML models as the core of a simulation program that predicts outcomes on patient scenarios to determine neighborhood-level factors that affect OHCA survival. The proposed ML model may provide metrics to assist decision making in resource allocation for the management of OHCA. |
| Workshops Attended | dsflkjdsfkljdslkfjldksfjkldsajflkadsjflkdsajlfkjsdklfsl |
| Career Development Activities | dsfdslkfjldsgjdslfjlkdsjflkdjlldsklglsd |
| table size | 35 |
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