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Research Article

THE INCIDENCE RATE OF INVASIVE CORPUS AND UTERUS CANCER IN THE UNITED STATES OF AMERICA: AN OBSERVATIONAL DESCRIPTIVE EPIDEMIOLOGICAL ANALYSIS OF DATA FROM THE CENTERS FOR DISEASE CONTROL AND PREVENTION 1999-2014

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A R T I C L E I N F O

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Cancerepidemiology; Invasivecorpus and uterus cancer; The United States of America; Age adjusted Incidence rate.

A B S T R A C T

Background: This study provides descriptive epidemiological data of invasive corpus and uterus cancer diagnosed from 1999 to 2014 in the United States of America.
Methods: This is a retrospective descriptive epidemiological analysis of invasive corpus and uterus cancer cases recorded in the Centres for Disease Control and Prevention from 1999 to 2014.
Results: Female Hispanic Americans living in the state of Detroit had the highest overall age-adjusted incidence rate (40.4 per 100,000 persons) of invasive corpus and uterus, from 1999 to 2014, compared with other races living in all states of America. The state of Delaware had the highest overall age-adjusted incidence rate (28.0 per 100,000 persons) of invasive corpus and uterus cancer among white and black Americans, compared with other races living in the south of the United States. While, the state of Seattle had the highest overall age-adjusted incidence rate (25.6 per 100,000 persons) of invasive corpus and uterus cancer among white, black, and Hispanic Americans, compared with other races living in the west of the United States. However, the northeast of the United States of America was the most affected area by corpus and uterus cancer, compared to the Midwest, South, and West of the United States.
Conclusion: This study revealed that the state of Detroit, Delaware, and Seattle are the best geographic areas in the United States of America for studying the most important risk factors of invasive corpus and uterus cancer among women across all races. The secret for confirming the real risk factor of corpus and uterus cancer can be found in the state of Detroit among female Hispanic American.Multiple case control studies should be conducted separately in these states across all races to determine the similarities and differences of the risk factors that every woman shares.

INTRODUCTION

Corpus and uterus cancer is the most common malignancy among women in Europe and other countries.[1] It is increased in a population with higher socioeconomic class compared with that in population with a lower socioeconomic class.[2] The probability of corpus uteri cancer is increased with age.[3-4] In the United States of America, corpus uteri cancer among women is considered the fourth most common cancer, after breast, colorectal, and lung cancer.[4-5] It accounts 6% of all diagnosed cancers in America. the International Agency for Research on Cancer estimated that the age-adjusted incidence rate for corpus uteri cancer was 19.5 per 100,000 population in 2012, and the age-adjusted mortality rate was 2.2 per 100,000 population.[6-7] The purpose of this study is to describe the pattern of invasive corpus uteri cancer in the United States of America, from 1999 to 2014, while focusing on the age adjusted incidence rate, stratified by state and race.

MATERIALS AND METHODS

This is a retrospective descriptive epidemiological study of invasive breast cancer cases diagnosed between 1999 and 2014 in the United States of America. The data were available and easily accessible from the website of the Centres for Disease Control and Prevention, through the Official Federal Statistics on cancer incidence registries. Based on these data, there are comprehensive cancer data for the 50 States in the United States of America from 1999 to 2014, exploring the age-adjusted incidence rate stratified by race and state. For the data analysis, the Statistical Package for the Social Sciences version 20.0 (SPSS) was used. The descriptive statistics of the data were performed by calculating the mean age-adjusted incidence rate stratified by race, and state.

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RESULTS

Invasive Corpus and Uterus Cancer in the North East of the United States of America

The overall age-adjusted incidence rate of invasive corpus and uterus cancer from 1999 to 2014 per 100,000 persons, was calculated from the Centres for Disease Control and Prevention. The highest overall age-adjusted incidence rates of invasive corpus and uterus cancer were observed in white American women living in the northeast of the United States, compared with black and Hispanic women. The overall age-adjusted incidence rates of invasive corpus and uterus cancer among white American women were approximately equal in all states of the northeast of the United States, with an estimated average around 30.0 per 100,000 persons (Table 1).

Table 1 Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the North East of theUnited States from 1999 to 2014

	Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the North East of the United States from 1999 to 2014			
Geographic Area	**All Races**	**White**	**Black**	**Hispanic**
United States	24.6	25.2	22.4	20.4
Northeast	29.9	30.9	25.4	23.9
New England	29.5	30.0	22.6	25.6
Connecticut	29.0	29.5	25.1	25.7
Maine	30.7	30.9	-	-
Massachusetts	29.1	29.7	21.2	-
New Hampshire	30.3	30.3	-	-
Rhode Island	29.8	30.1	-	-
Vermont	32.1	32.4	-	-
Middle Atlantic	30.0	31.3	25.8	23.6
New Jersey	29.9	31.5	24.8	23.2
New York	29.4	30.7	27.0	23.8
Pennsylvania	31.0	31.9	23.6	23.2

(-) Means in all tables: Rates are suppressed if fewer than 16 cases were reported in a specific category (area, race, ethnicity)

However, the northeast of the United States of America was the most affected area by corpus and uterus cancer compared to the Midwest, South, and West of the United States.

Invasive Corpus and Uterus Cancer in the Midwest of the United States of America

The highest overall age-adjusted incidence rate of invasive corpus and uterus cancer was observed in the state of Detroit, with an estimated average of (40.4per 100,000 persons). The estimated overall age-adjusted incidence rates of invasive corpus and uterus cancer in the state of Detroit, from 1999 to 2014 were higher among American Hispanic women compared with other races living in the Midwest and all states of America (Table 2).

Table 2 Overall age-adjusted incidence rate of invasive corpus and uterus cancer in Midwest of the United States from 1999 to 2014

	Overall age-adjusted incidence rate of invasive corpus and uteruscancer in the Midwest of the United States from 1999 to 2014			
Geographic Area	**All Races**	**White**	**Black**	**Hispanic**
United States	24.6	25.2	22.4	20.4
Midwest	27.2	27.7	22.7	22.0
East North Central	27.5	28.1	22.8	22.2
Illinois	27.2	28.0	23.5	22.4
Indiana	26.4	26.9	21.3	24.3
Michigan	28.1	28.6	24.2	26.9
Detroit	28.6	30.3	24.6	**40.4**
Ohio	27.6	28.3	20.8	20.1
Wisconsin	28.7	28.8	25.2	25.6
West North Central	26.5	26.7	22.0	20.9
Iowa	29.2	29.3	-	-
Kansas	24.1	24.0	25.4	24.9
Minnesota	28.0	27.9	25.3	-
Missouri	25.0	25.4	22.7	24.5
Nebraska	26.9	27.3	-	-
North Dakota	25.3	25.4	-	-
South Dakota	27.2	27.2	-	-

Invasive Corpus and Uterus Cancer in the South of the United States of America

The highest overall age-adjusted incidence rate of invasive corpus and uterus cancer was observed in the state of Delaware, with an estimated average of (28.0 per 100,000 persons). The estimated overall age-adjusted incidence rates of invasive corpus and uterus cancer in the state of Delaware, from 1999 to 2014, were higher among white and black American women compared with other races living in the south of the United States. However, the state of Louisiana recorded the lowest overall age-adjusted incidence rate (17.8 per 100,000 persons) of invasive corpus and uterus cancer among white and black American women living in the south of the United States of America (Table 3).

Table 3 Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the South of United States from 1999 to 2014

	Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the south of the United States from 1999 to 2014			
Geographic Area	**All Races**	**White**	**Black**	**Hispanic**
United States	24.6	25.2	22.4	20.4
South	21.5	21.6	22.3	20.6
South Atlantic	22.3	22.5	22.5	21.6
Delaware	28.0	29.0	27.3	-
District of Columbia	27.1	**23.6**	**28.1**	-
Florida	22.2	22.1	24.2	22.6
Georgia	19.7	19.9	20.9	18.9
Atlanta	20.7	21.1	21.0	20.0
Maryland	24.1	25.3	22.0	21.9
North Carolina	22.3	22.4	22.6	18.3
South Carolina	20.8	20.1	23.7	-
Virginia	22.6	23.3	19.9	16.7
West Virginia		29.4	-	-
East South Central	20.9	21.1	21.1	13.1
Alabama	18.0	17.6	20.1	-
Kentucky	23.9	24.3	20.7	-
Mississippi	19.4	18.6	22.5	-
Tennessee	20.3	20.8	18.6	22.6
West South Central	19.6	19.8	19.8	19.7
Arkansas	19.7	19.8	19.3	-
Louisiana	**17.8**	**17.5**	**19.6**	-
Oklahoma	20.6	20.0	19.8	-
Texas	19.8	20.1	20.1	19.5

Invasive Corpus and Uterus Cancer in the West of the United States of America

The highest overall age-adjusted incidence rate of invasive corpus and uterus cancer was recorded in the state of Seattle, with an estimated average of (25.6 per 100,000 persons). The estimated overall age-adjusted incidence rates of invasive corpus and uterus cancer in the Seattle State, from 1999 to 2014, were higher among white, black, and Hispanic women compared to other races living in the west of the United States. However, the state of Nevada was the lowest area affected by invasive corpus and uterus cancer among white, black, and Hispanic women compared to other races living in the west of the United States of America **(Table 4)**.

Table 4 Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the West ofUnited States from 1999 to 2014

	Overall age-adjusted incidence rate of invasive corpus and uterus cancer in the west of the United States from 1999 to 2014			
Geographic Area	**All Races**	**White**	**Black**	**Hispanic**
United States	24.6	25.2	22.4	20.4
West	22.8	23.2	20.4	18.4
Mountain	20.9	21.0	16.3	17.3
Arizona	20.0	19.7	21.9	17.4
Colorado	20.8	21.0	21.9	16.8
Idaho	23.0	23.0	-	-
Montana	24.5	24.0	-	-
Nevada	**18.7**	**19.3**	**17.7**	**16.8**
New Mexico	21.2	21.1	-	17.6
Utah	24.1	24.1	-	26.6
Wyoming	20.7	20.7	-	-
Pacific	23.6	24.4	21.5	19.0
Alaska	23.0	24.1	-	-
California	23.0	24.0	21.8	18.9
San Francisco-Oakland	24.8	26.4	23.3	21.3
San Jose-Monterey	22.2	24.2	-	18.1
Los Angeles	23.8	25.1	23.2	19.5
Hawaii		24.9	-	-
Oregon	25.2	25.2	-	24.7
Washington	25.2	25.6	23.7	19.9
Seattle-Puget	**25.6**	**26.5**	**25.3**	**27.5**

DISCUSSION

This descriptive epidemiological study of invasive corpus and uterus cancer among women in the United States of America explores a valuable information about the pattern of the disease in the entire population. It focuses on the age-adjusted incidence rate of invasive corpus and uterus cancer stratified by state and race. The result of the study is based on the data recorded in the Centres for Disease Control and Prevention, from 1999 to 2014.

In the North East of the United States, we have observed that white American women had the highest overall age-adjusted incidence rates of invasive corpus and uterus cancer compared with black and Hispanic women living in the northeast of the United States. The overall age-adjusted incidence rates of invasive corpus and uterus cancer among white American women were approximately equal in all states of the northeast of the United States. The most likely reason for equal age-adjusted incidence rate is that most white women across all states in the northeast were equally sharing the same risk factors of the invasive corpus and uterus cancer. In addition, the northeast of the United States of America was the most affected area by corpus and uterus cancer compared to the Midwest, South, and West of the United States.

In the Midwest of the United States, the overall age-adjusted incidence rates of invasive corpus and uterus cancer, from 1999 to 2014 were higher among American Hispanic women living in the state of Detroit compared with other races in all states of America. The most likely reason for this rising age-adjusted incidence rate is that most American Hispanic women were more exposed to a specific risk factor that may does not appear in white and black women living in the same area and other states in the Midwest of America. Therefore, the state of Detroit is the best geographic area in the United States of America for studying the most important risk factors of invasive corpus and uterus cancer among American Hispanic women. Figure 1, shows how one can identify the most important risk factor for invasive corpus and uterus cancer among white, black, and Hispanic women living in the state of Detroit. The risk factor can be identified by conducting three (3) case-control studies among women across all races (white, black, and Hispanic). These studies help to determine the reason that contribute in the increase of age-adjusted incidence rates of invasive corpus and uterus cancer among American Hispanic women.

In the South of the United States, the overall age-adjusted incidence rates of invasive corpus and uterus cancer, from 1999 to 2014, were higher among white and black women living in the state of Delaware compared with other races in the south of America. The most likely reason for this rising age-adjusted incidence rate is that most white and black women were more exposed to a specific risk factor that may does not appear in white and black women living in the south of America. **Figure 2**, shows how one can identify the most important risk factor of invasive corpus and uterus cancer among white and black women living in the state of Delaware. However, the state of Louisiana recorded the lowest overall age-adjusted incidence rates of invasive corpus and uterus cancer, from 1999 to 2014, in the south of the United States. The state of Louisiana probably had a specific protective factor that contribute in the decrease of age-adjusted incidence rate of invasive corpus and uterus cancer among white and black women.**Figure 3**, shows how one can identify the most important protective factor for invasive corpus and uterus cancer among white and black women living in the state of Louisiana.

In the West of the United States, the overall age-adjusted incidence rates of invasive corpus and uterus cancer, from 1999 to 2014, were higher among white, black, and Hispanic women living in the state of Seattle compared with other races in the west of America. The most likely reason for this rising age-adjusted incidence rate is that most white, black, and Hispanic women were more exposed to a specific risk factor that may does not appear in the same races living in the west of America. **Figure 4**, shows how one can identify the most important risk factor of invasive corpus and uterus cancer among women across all races living in the state of Seattle. However, the state of Nevada recorded the lowest overall age-adjusted incidence rates of invasive corpus and uterus cancer, from 1999 to 2014, in the west of the United States. The state of Nevada probably had a specific protective factor that contribute in the decrease of age-adjusted incidence rate of invasive corpus and uterus cancer among women across races living in the same geographic and other parts in the west of America. **Figure 5**, shows how one can identify the most important protective factor for invasive corpus and uterus cancer among women of all races living in the state of Nevada.

Finally, it is very important to conduct multiple case-control studies in the highest and lowest area affected by invasive corpus and uterus cancer adjusted by race. This procedure helps to make a good comparison between the risk and protective factors of corpus and uterus cancer among American women.

Figure 1

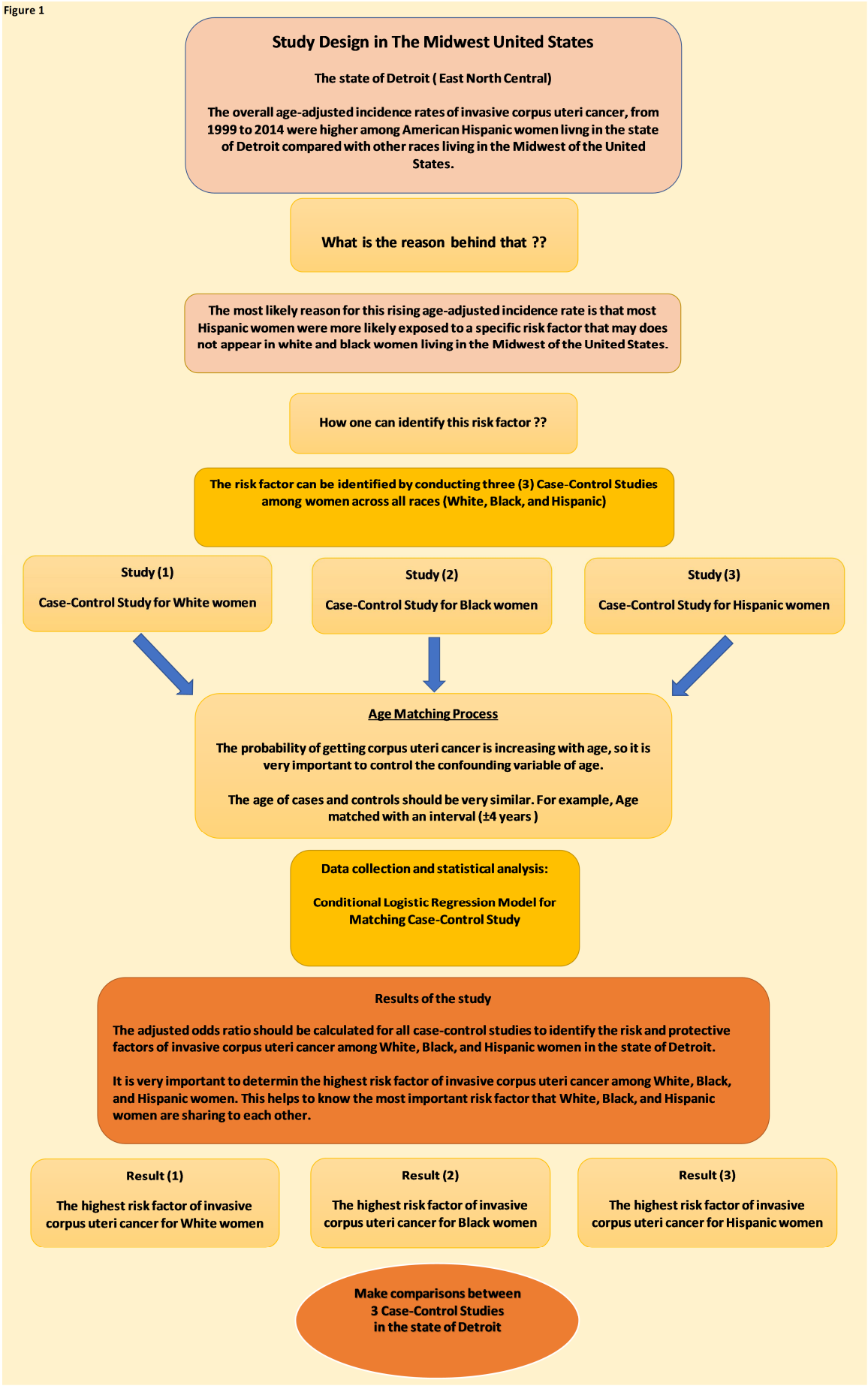

Figure 1 Study Design in The Midwest of the United States (The state of Detroit)

Figure 2

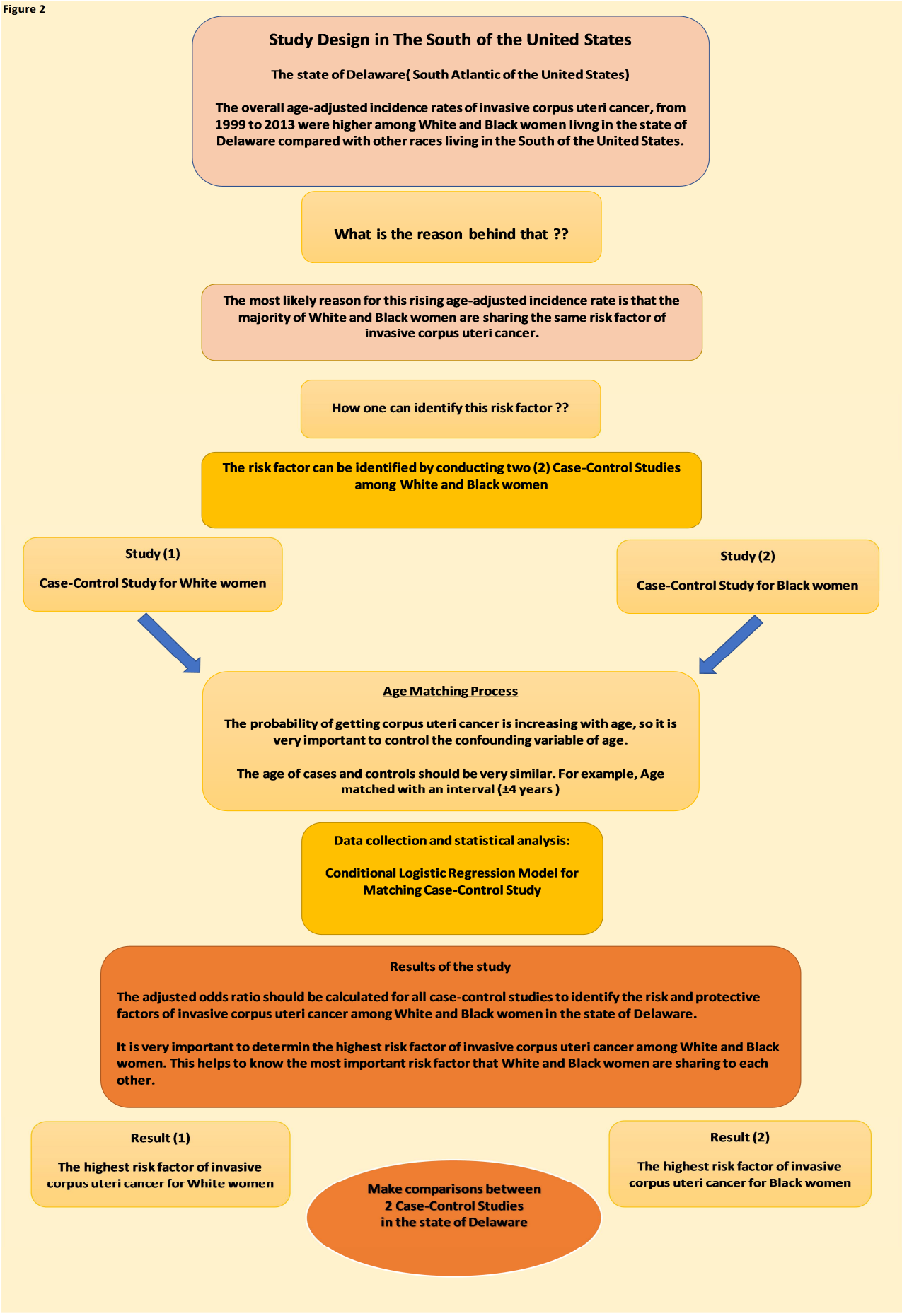

Figure 2 Study Design in The South of the United States (The state of Delaware)

Figure 3

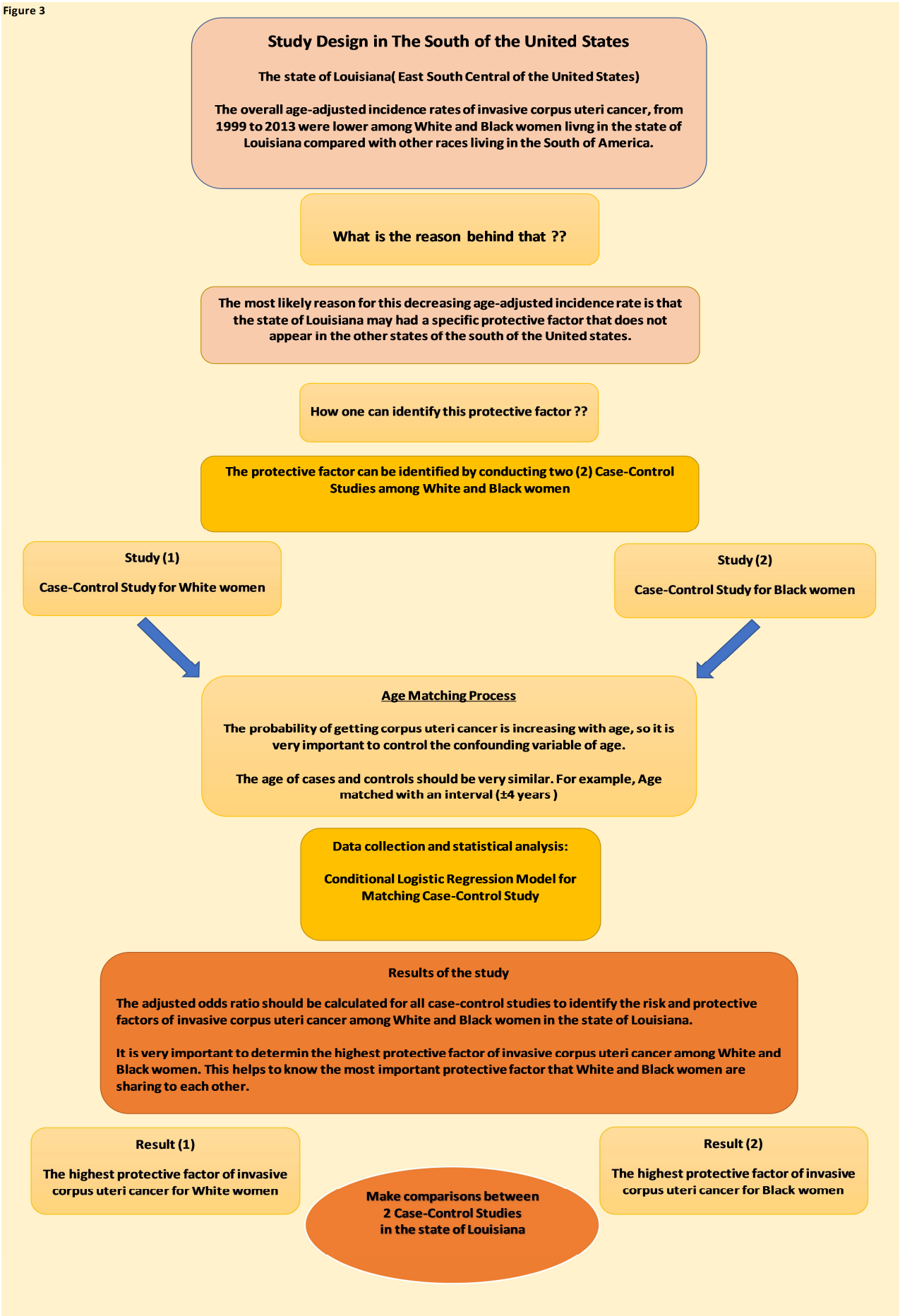

Figure 3 Study Design in The South of the United States (The state of Louisiana)

Figure 4

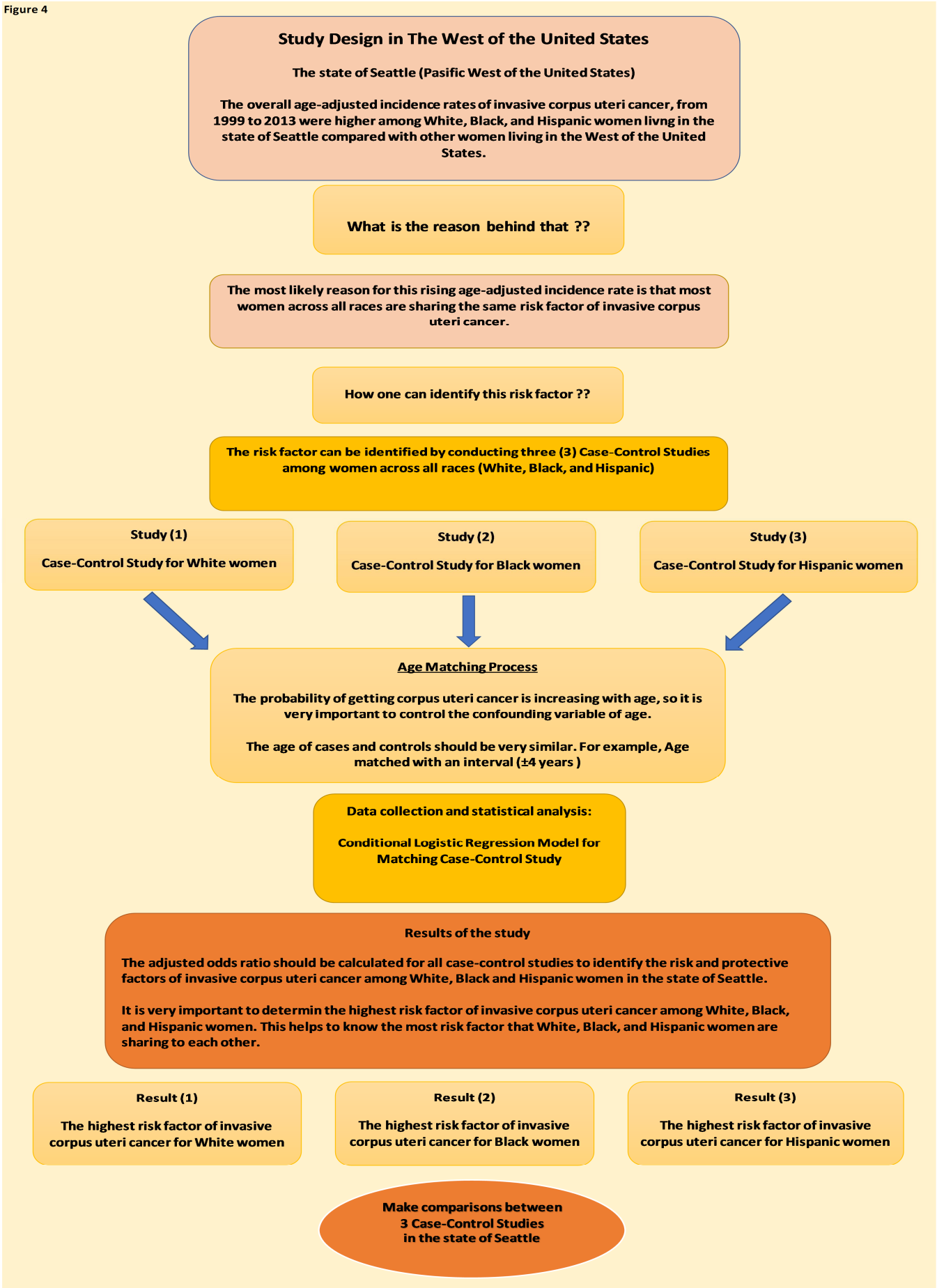

Figure 4 Study Design in The West of the United States (The state of Seattle)

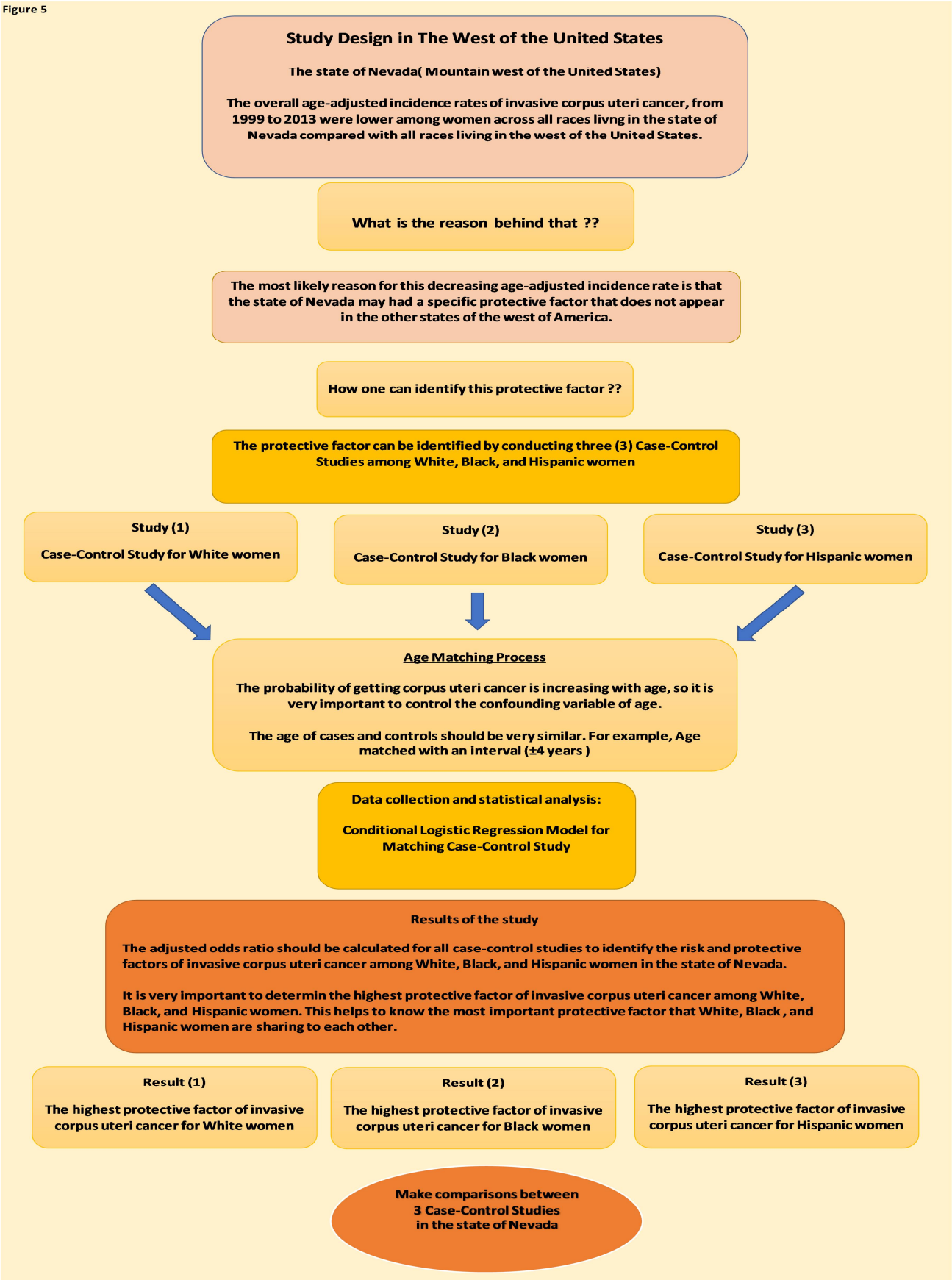

Figure 5 Study Design in The West of the United States (The state of Nevada)

CONCLUSION

Our study revealed that the state of Detroit, Delaware, and Seattle are the best geographic areas in the United States of America for studying the most important risk factors of invasive corpus and uterus cancer among women across all races. The secret for confirming the real risk factor of corpus and uterus cancer can be found in the state of Detroit among Hispanic American women. The state of Louisiana and Nevada recorded the lowest overall age-adjusted incidence rates of invasive corpus and uterus cancer among American women living in the United States of America. Multiple case control studies should be conducted separately in these states across all races to determine the similarities and differences of the risk and protective factors that every woman shares.

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