The effect of the COVID-19 pandemic in the prevalence of Diabetes Mellitus Type 1 and 2 in children and young adults in Greece. Real World data from Greece

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INTRODUCTION

- Prevalence of Type 1 and Type 2 Diabetes Mellitus (DM) is rapidly increasing.

- During the COVID-19 pandemic and the subsequent lockdown, physical activities have been disrupted for a substantial proportion of the population.

- An increase in the prevalence of DM has been observed in young ages, especially in children in adolescence and post-adolescence.(1-4)

AIM

- To report the prevalence of Type 1 and Type 2 DM in children and young adults in Greece.

- To investigate potential effect of lifestyle changes due to the covid-19 pandemic on the prevalence.

METHOD

- Data were obtained from the Register of Diabetic Patients of the National Organization of Health Care Provision for the following periods 1) 2019-2020 (year 2019) and 2) 2020 - 2021 (year 2020)

- Data included patients aged from 0 to 24 years of age (YoA), stratified by gender, age group and Prefecture (NUTS 3 level).

- Data from the two time periods were compared to detect possible differences that may be attributed to lifestyle changes due to the pandemic.

- Results were portrayed on thematic maps, leveraging geographical information systems – GIS

- Hot Spot Analysis was performed implementing Getis-Ord Gi* statistic to identify statistically significant spatial clusters of high values (hot spots) and low values (cold spots).

- Prevalence of DM patients was expressed per 100,000 population based on the 2011 census data of the Hellenic Statistical Authority.

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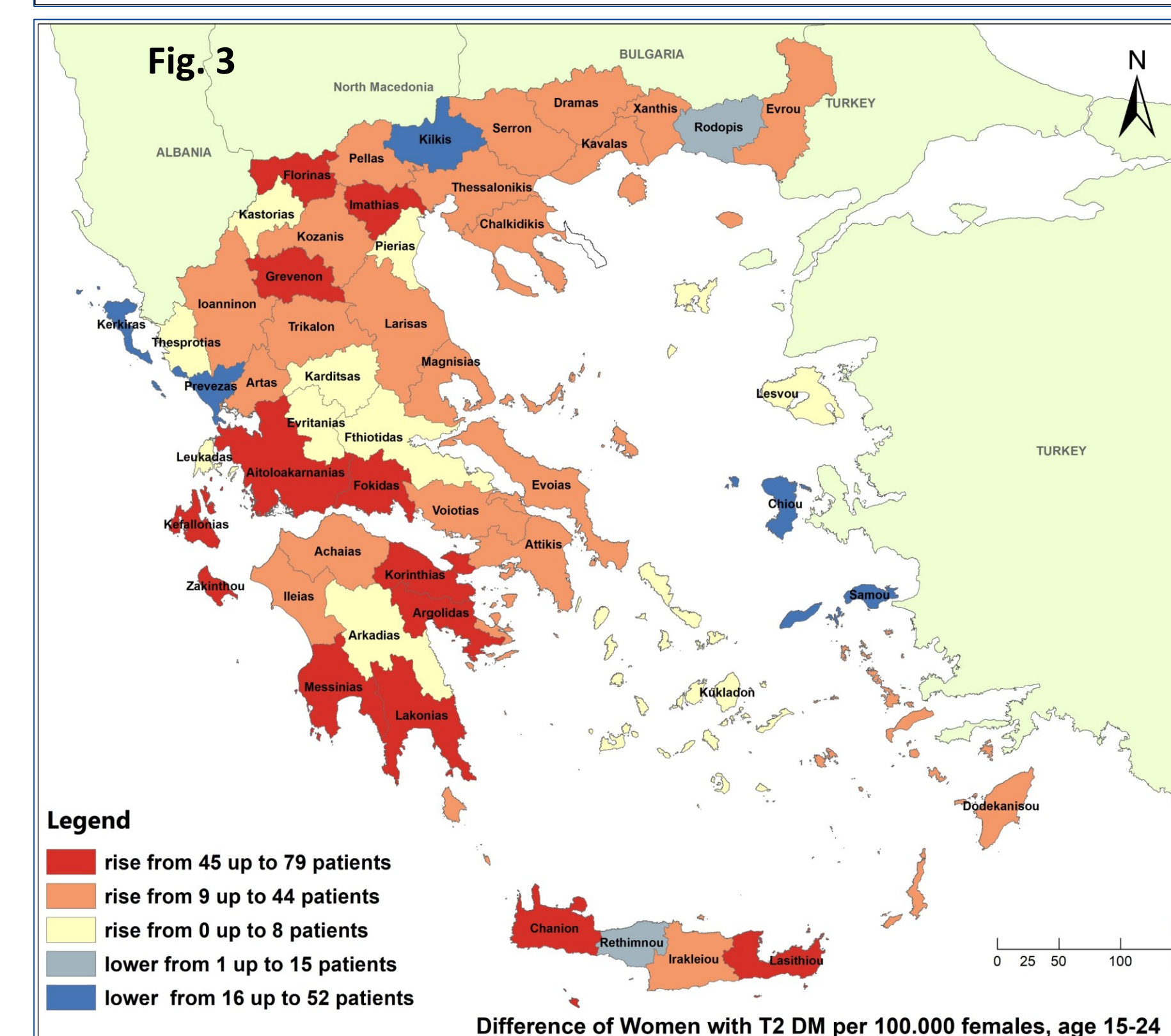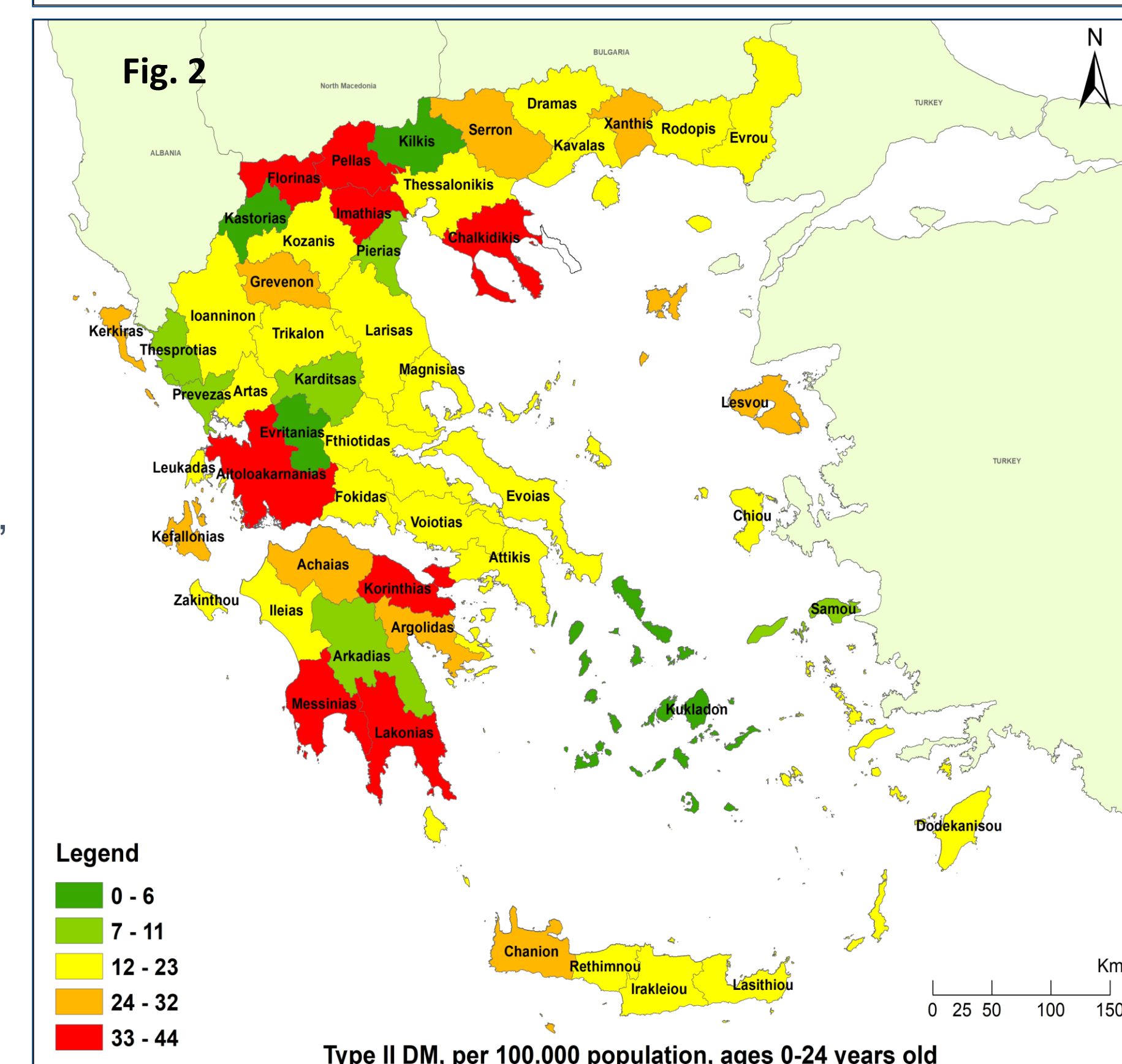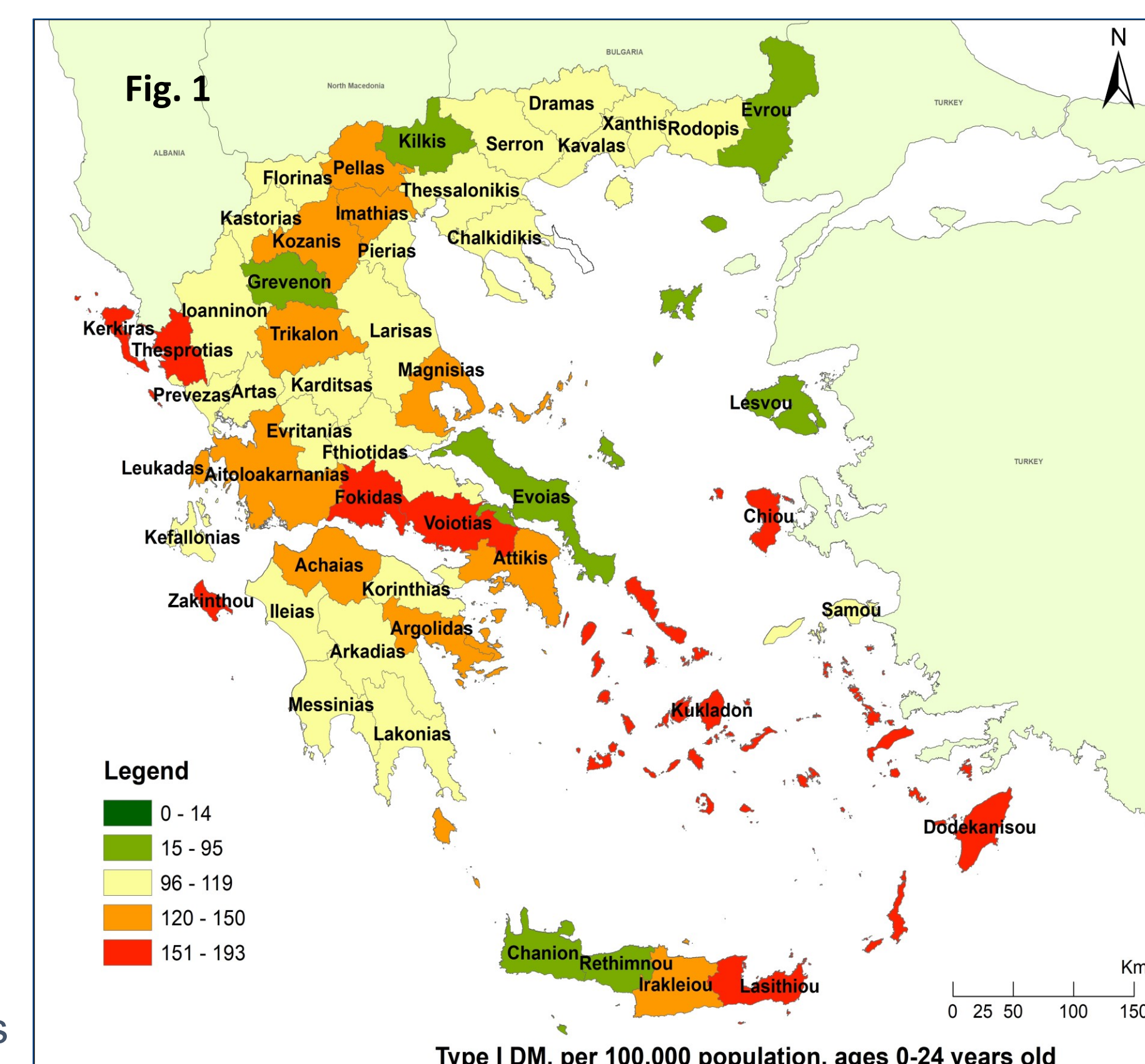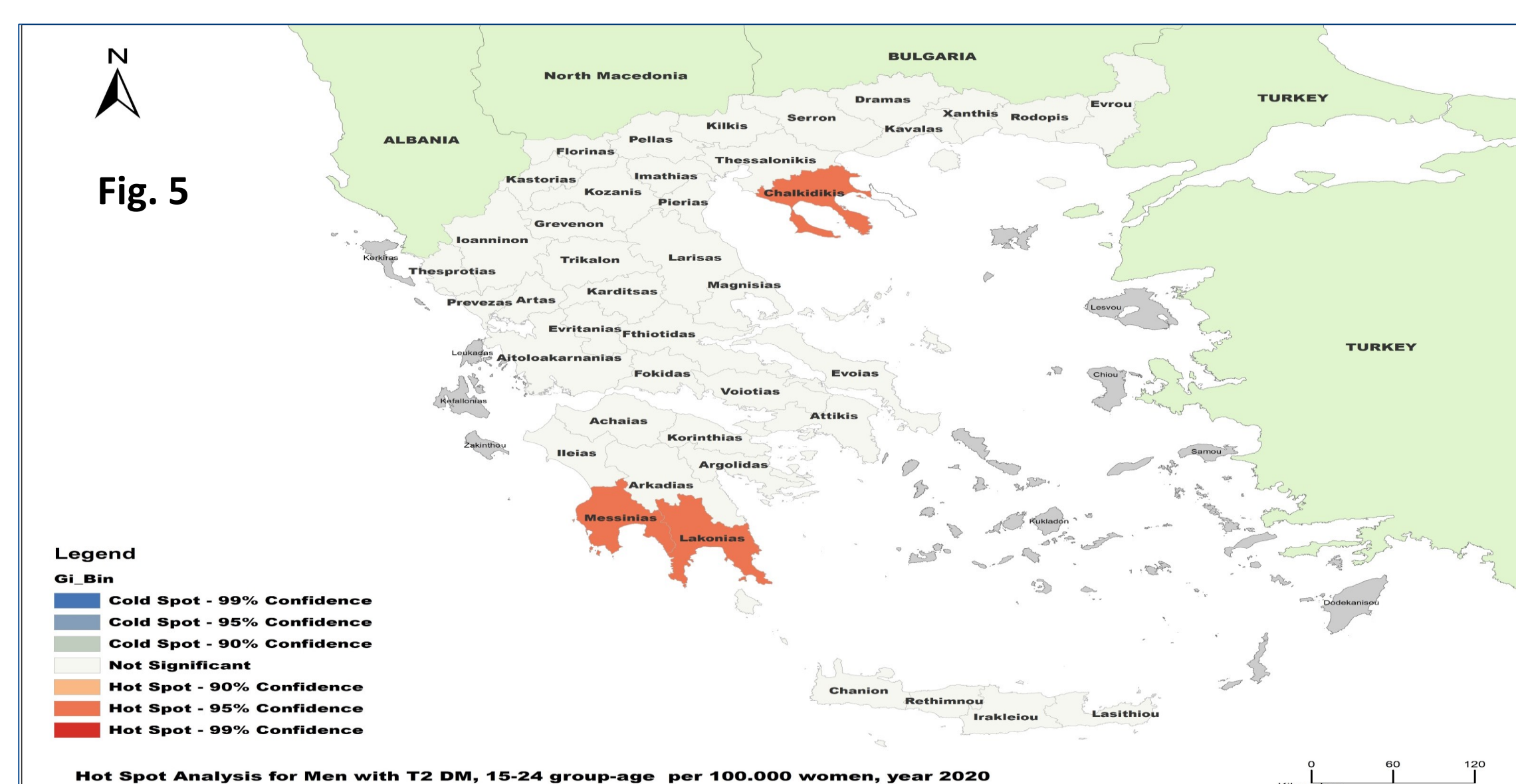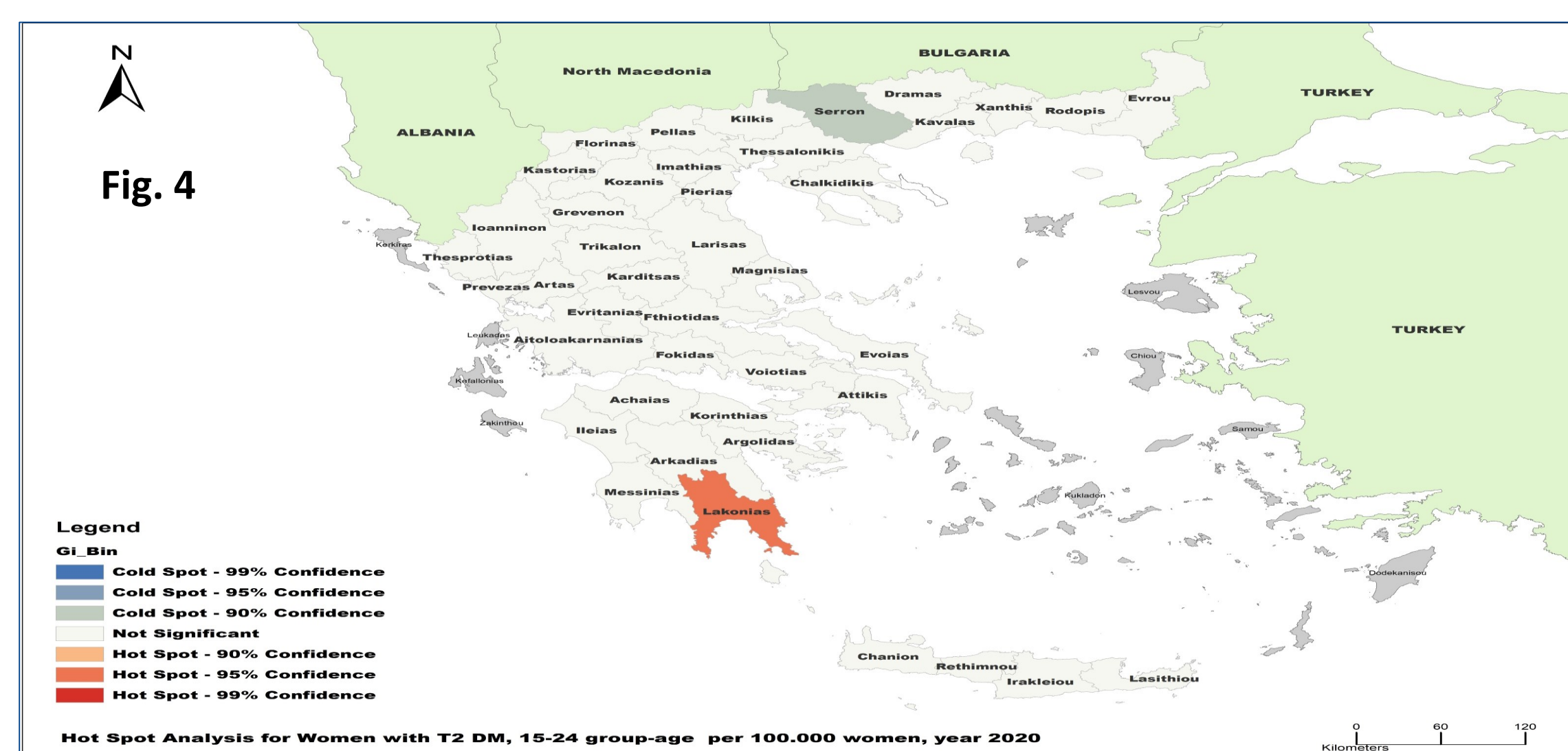
RESULTS

Type 1 DM

- DM prevalence, for the age group of 0-24 YoA did not significantly differ between the two under study periods.

- DM prevalence is estimated at 118 per 100.000 (120 per 100.000 females and 117 per 100.000 males).

- The highest prevalence was observed in the regions of the Aegean and Dodecanese Islands, East Creta and Ionian Islands.

- No hot or cold clusters were shown in the cluster analysis (Fig. 1)

Type 2 DM

- The prevalence of or Type 2 DM, was higher in girls (25 per 100.000 girls vs 16 per 100.000 boys).

- The highest prevalence was observed among individuals aged 15 – 24 YoA (43 per 100.000, 57 per 100.000 females and 31 per 100.000 males).

- The regions with the highest observed increase in female prevalence were the Peloponnese, Creta and the south-west of Greece (Fig. 3)

- In 2019 371 patients with Type 2 DM (0 - 24 YoA) were registered (145 males and 226 females). In 2020 registered patients were 595 (230 males and 365 females).

- 2020 prevalence is estimated at 28 per 100.000 population. 2019 prevalence is estimated at 13 per 100.000 population.

- For the age group 15 – 24 YoA, prevalence almost doubled, from 28/100.000 in 2019 to 43/10.000 in 2020.

- The highest prevalence was observed in the regions of Peloponnese and in the northwest of Greece (Florina, Pella and Chalcidice Counties)(Fig. 2)

- Hot-spot analysis for T2DM patients, suggested that for females 15 – 24 YoA, a spatial cluster of high values exists in Laconia's Prefecture (Fig. 4) and for males in Chalcidice, Messenia and Laconia's Prefecture (Fig. 5)

Fig. 1

Legend
- 0 - 14
- 15 - 95
- 96 - 119
- 120 - 150
- 151 - 193

Type I DM, per 100.000 population, ages 0-24 years old

Fig. 2

Legend
- 0 - 6
- 7 - 11
- 12 - 23
- 24 - 32
- 33 - 44

Type II DM, per 100.000 population, ages 0-24 years old

Fig. 3

Legend
- rise from 45 up to 79 patients
- rise from 9 up to 44 patients
- rise from 0 up to 8 patients
- lower from 1 up to 15 patients
- lower from 16 up to 52 patients

Difference of Women with T2 DM per 100.000 females, age 15-24

Fig. 4

Legend
Gi_Bin
- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Hot Spot Analysis for Women with T2 DM, 15-24 group-age per 100.000 women, year 2020

Fig. 5

Legend
Gi_Bin
- Cold Spot - 99% Confidence
- Cold Spot - 95% Confidence
- Cold Spot - 90% Confidence
- Not Significant
- Hot Spot - 90% Confidence
- Hot Spot - 95% Confidence
- Hot Spot - 99% Confidence

Hot Spot Analysis for Men with T2 DM, 15-24 group-age per 100.000 women, year 2020

CONCLUSIONS

- Prevalence of Type 1 DM showed no significant variation among children and young adults (0 – 24 YoA), between the years 2019 and 2020.

- The prevalence of Type 2 DM almost doubled in 2020 is an alarming public health outcome

- This result may be reflecting changes in lifestyle (reduction in physical activity, increase in time in front of screens, increase in sedentary life, etc.) and in diet (eating more meals, increase in obesity) as result of the restrictions that accompanied the pandemic mitigation measures,

- Measures to improve physical exercise and nutrition should be planned and implemented aiming the reverse of this negative impact.

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