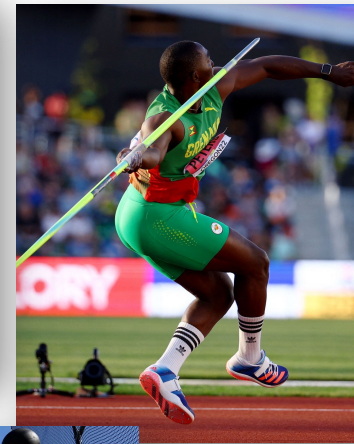


World Athletics Outdoor Data - An Analysis

Effects of the Global COVID-19 Pandemic
and Carbon-Plated Shoe Technology on
Annual Performance Lists 2015-2022



World Athletics Outdoor Track & Field Data Analysis – Synopsis -2015-2022

Introduction

The past decade has seen two major impacts on the global performance of athletes:

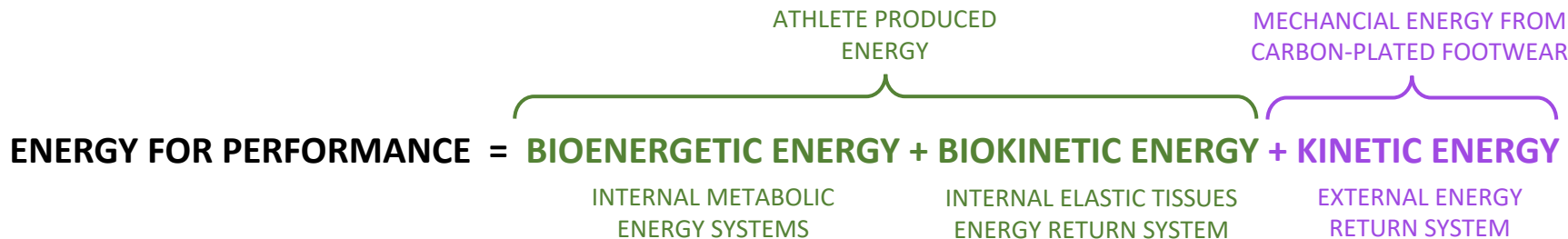
1. The COVID-19 Pandemic
2. The introduction and availability of Carbon-plated Footwear Technology

How can we identify and evaluate this impact of both COVID-19 and Carbon-plated Footwear Technology?

Performance Criteria

Examining performance criteria over time is one way of evaluating an impact. Normally, the number of athletes globally who exceed a certain performance criterion is relatively stable from year-to-year, with slight fluctuations in Olympic and pre-Olympic years. Also, it is expected to see a gradual increase in the number of athletes exceeding the criterion over time, through natural 'event development'. The years from 2015-2022 are analysed here.

Since the Carbon-plated footwear provides an added and external mechanical kinetic unit to the body's internal kinetic chain we can simply and accurately compare the differences in performance from when Carbon-plated shoes and spikes became globally available to the previous period, when athletes wore 'conventional' shoes and spikes.



Fatigue-Resistant Performance Enhancement

Carbon-plated track & field spikes specifically provide a fatigue-resistant performance enhancement to athletes through two potential sources:

1. An external, metabolic-sparing kinetic energy return
 - most relevant to improving Running Economy in Endurance: 800m - Marathon
2. Power amplification through the timing of an external kinetic energy return
 - most relevant in the force production phase of the 'Power' events: Sprints, Hurdles, Jumps, Throws and Combined Events.

What the Graphs Reveal by Event Group

Fatigue-Resistant Performance Enhancement

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Endurance

800m - 10,000m All events show the significant impact of Carbon-plated spikes on improving performance for both Men and Women
Note: from late 2016 some athletes have worn Carbon-plated 'Road' shoes in 5000m and 10,000m track races and continue to do so in 2022 but are WA-restricted since 2020. In 2022 the Men's 5000m and 10,000m showed the greatest improvement, while Women stabilised previous improvement but with a slight fall-back in the 5000m.
(from Aug 2020, World Athletics (WA) restricted carbon-plated racing flats for the track by midsole thickness of ≤ 25 mm)

Sprints & Hurdles

100m - 400m 2022 saw significant impact on all sprint performances for Men. While in 2022 Women show continued significant improvement at 100m and a stabilisation of performance at other distances.

Hurdles Men's 110mH shows significant improvement in 2021 and 2022. Women's hurdles show stabilization of performance

Jumps- Horizontal and Vertical

Jumps In all Jumps, Men appear to still be in the process of recovering from the impact of COVID
In all Jumps, Women show significant improvement in the vertical jumps but a fall-back in the linear jumps

Throws – Linear and Rotational

Throws In all Throws, Men appear in 2022 to still be in the process of recovering from the impact of COVID
Women in 2022 show a stabilisation of the 2019 significant improvement in the Shot and Hammer and a slight fall-back in the Javelin and Discus

Combined Events

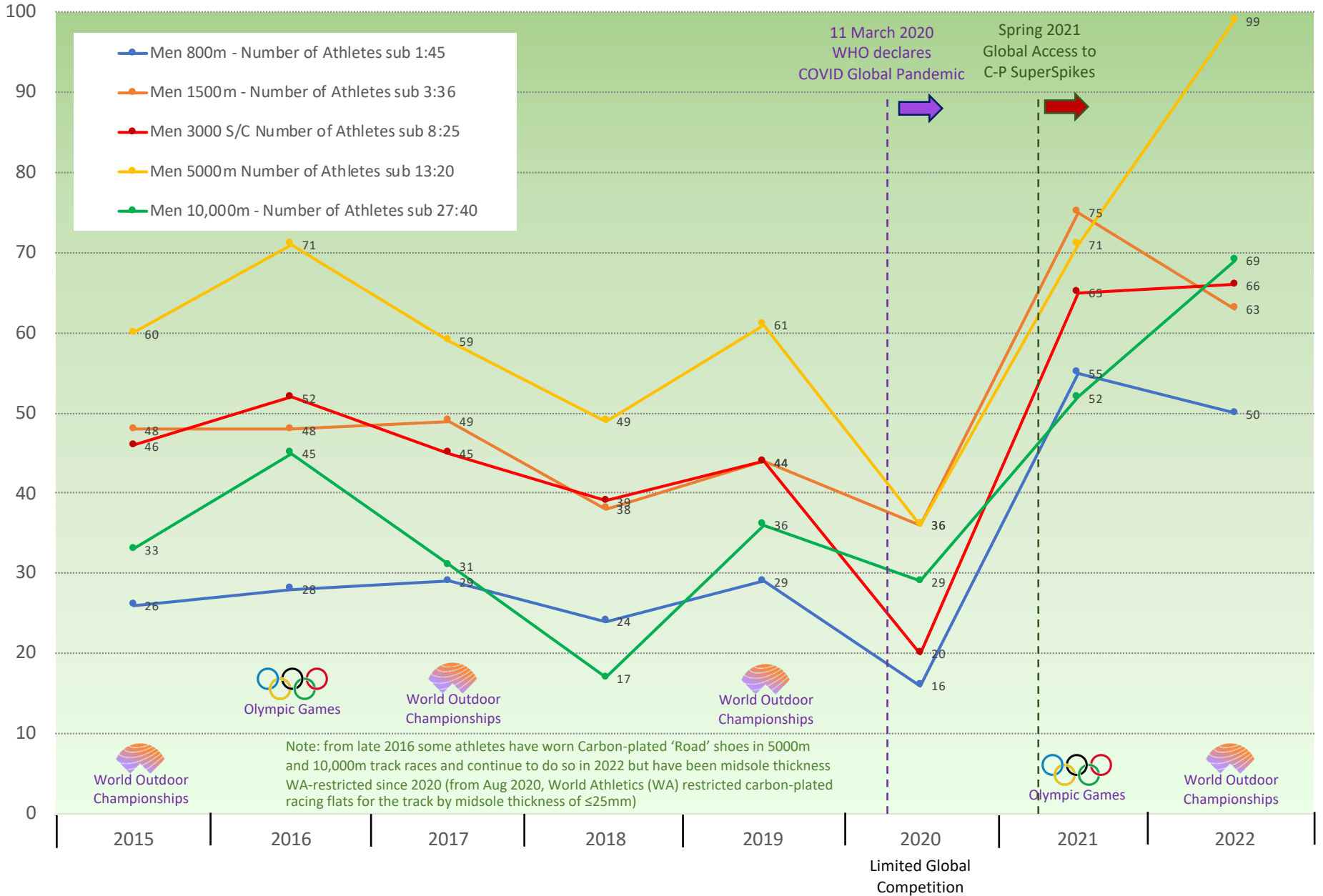
Decathlon The number of Men exceeding 8,000 pts and 7,750 pts shows improvement in 2022

Heptathlon The number of Women exceeding 6,250 pts showed improvement in 2021 but 2022 shows a fall-back

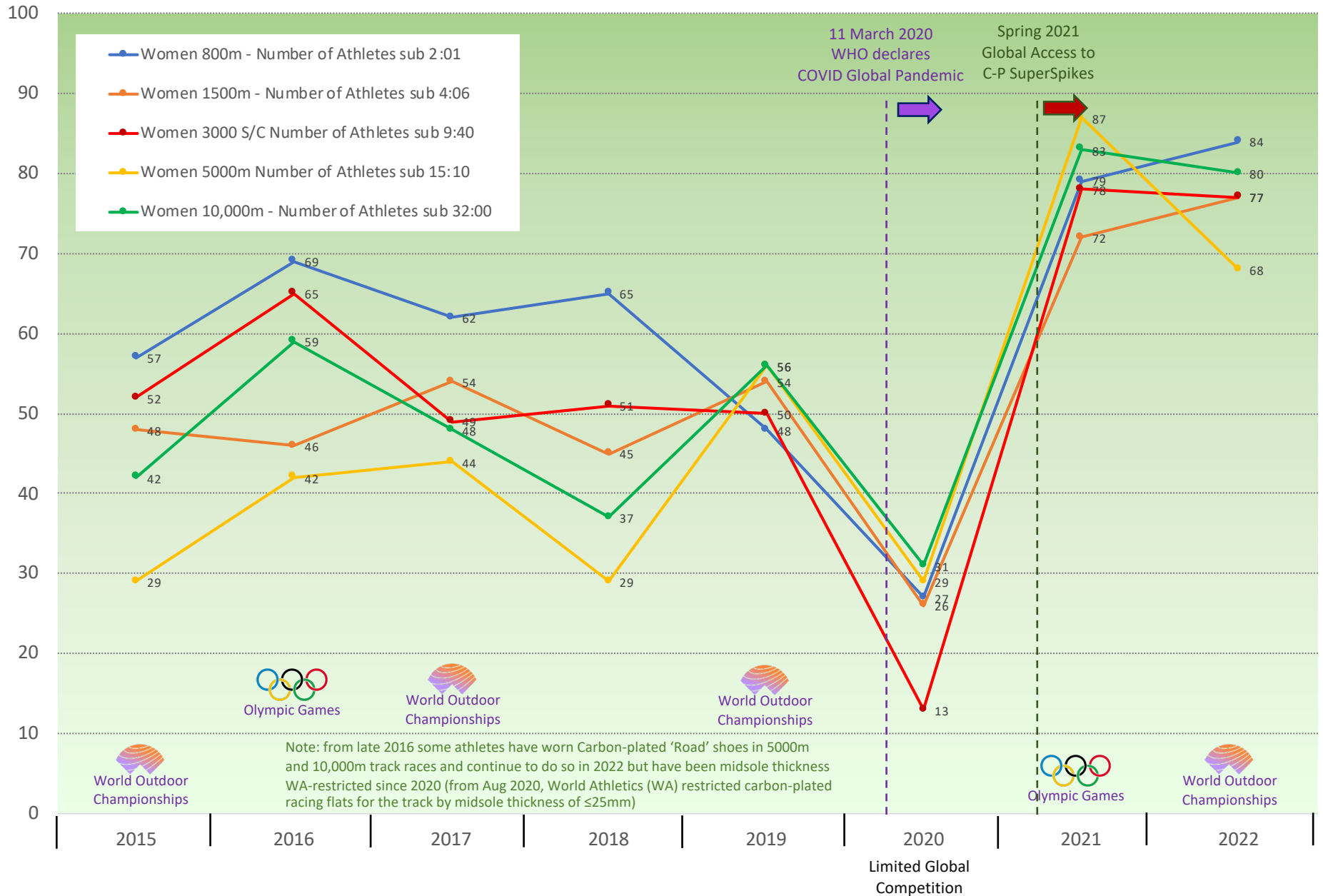
Conclusion

There is no disputing the significant impact of Carbon-plated spike technology on the running events at all velocities. The other event groups show some impact but not such a consistent picture. This could be because the Carbon-plated footwear for the 'power' events was developed later, is not as widely available yet, or only available to the very elite athletes as indicated in the Combined Events.

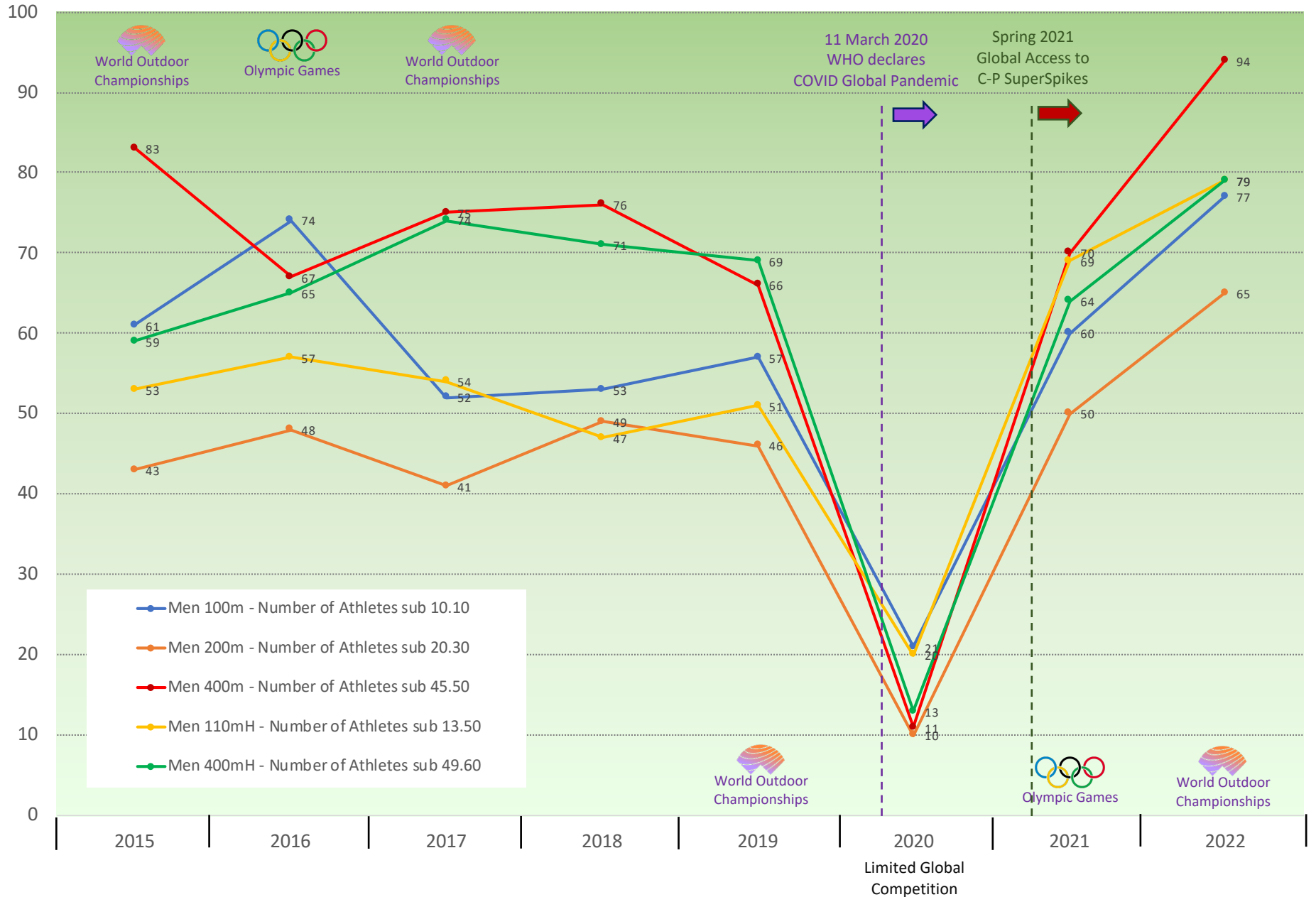
World Athletics - Men Outdoor Track 800m-10,000m Performances 2015-2022



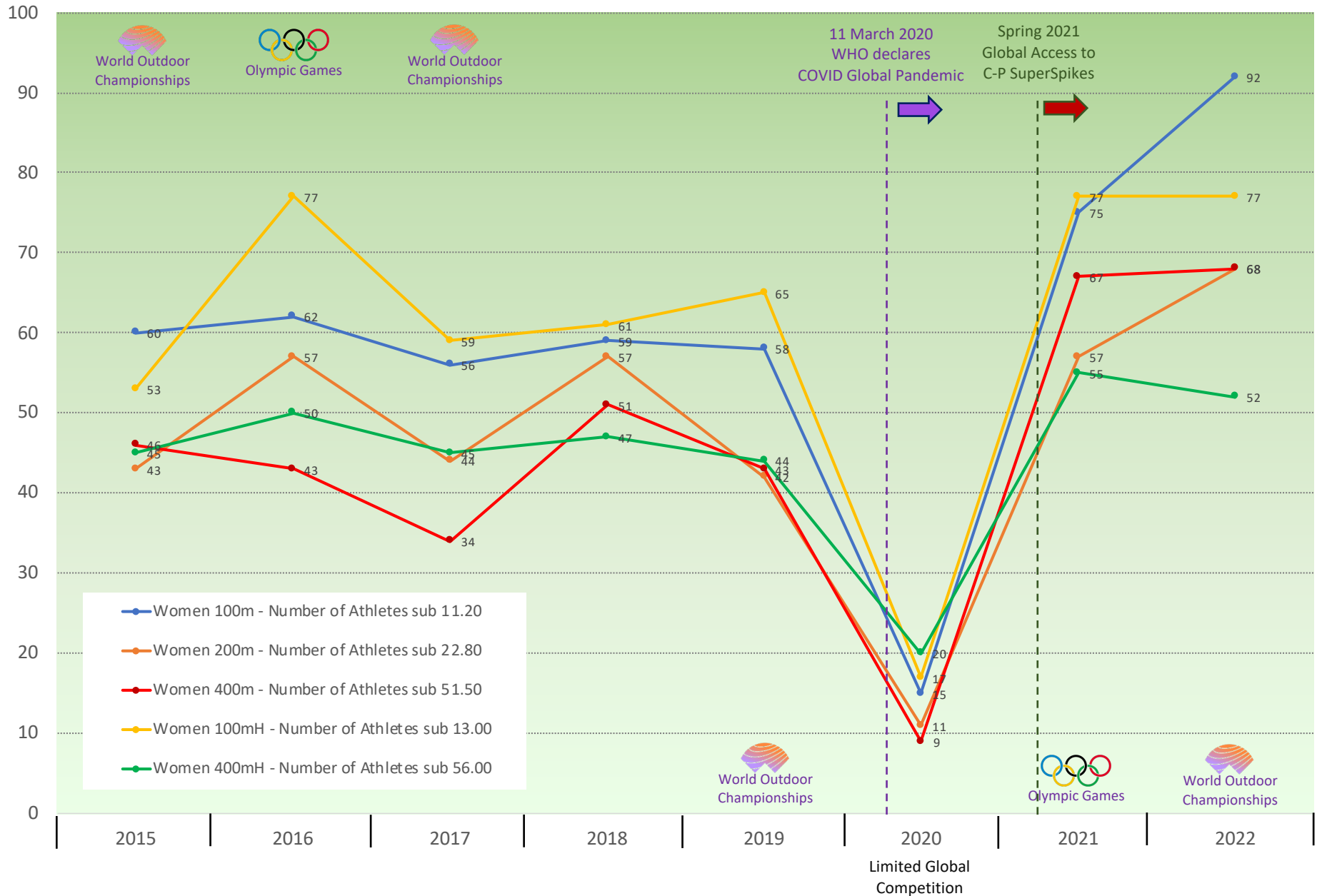
World Athletics - Women Outdoor Track 800m-10,000m Performances 2015-2022



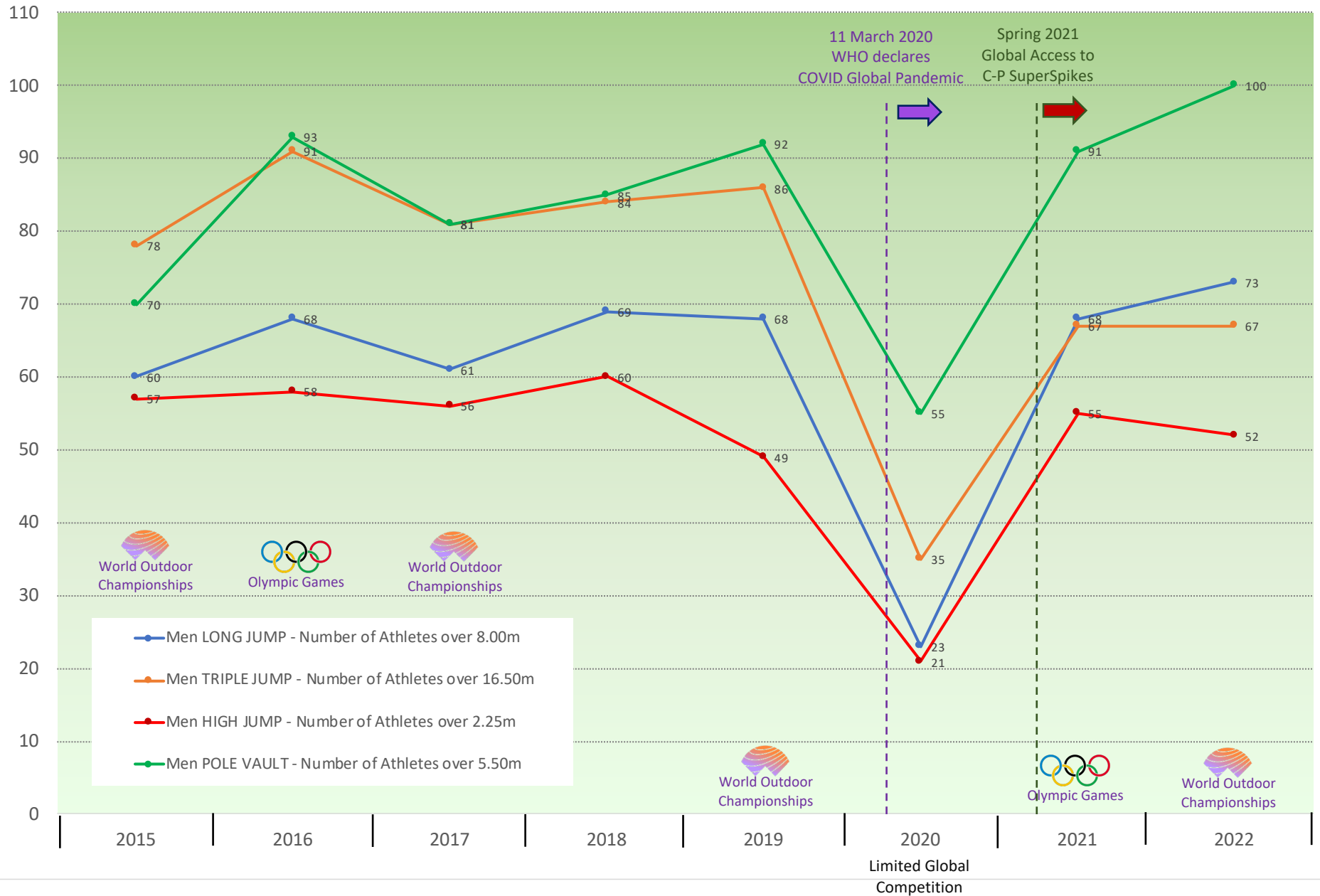
World Athletics - Men Outdoor Track 100m-400mH Performances 2015-2022



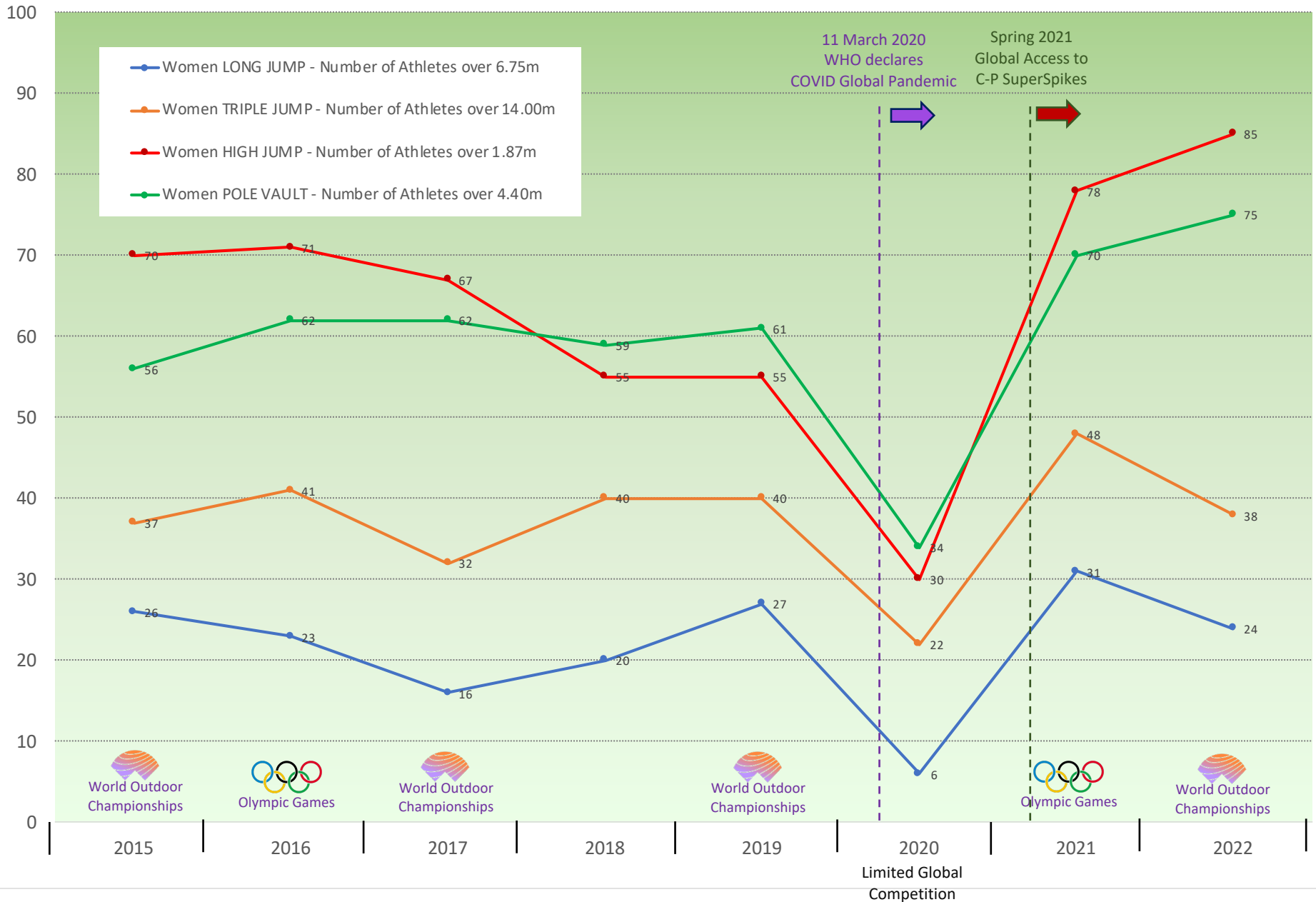
World Athletics - Women Outdoor Track 100m-400mH Performances 2015-2021



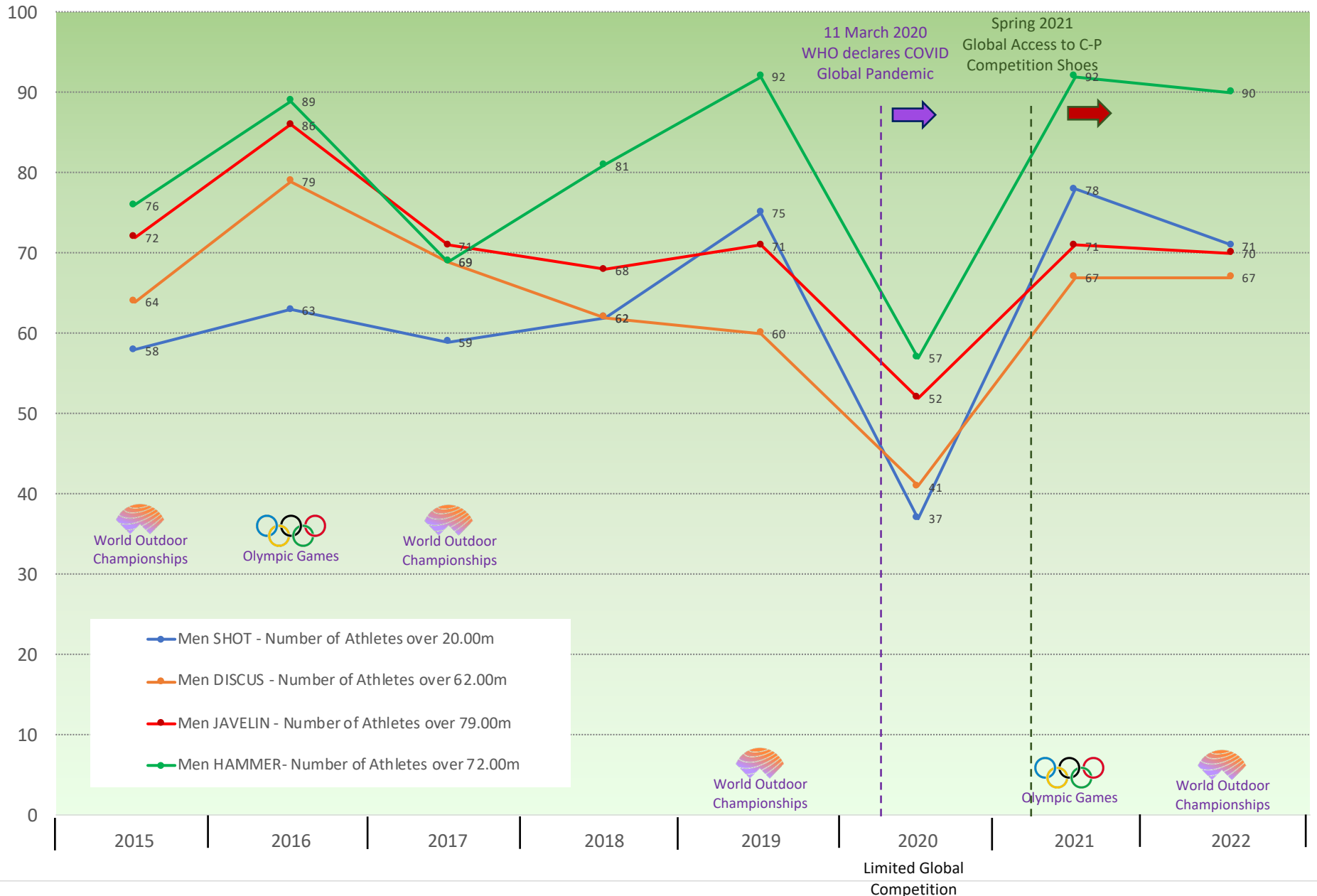
World Athletics - Men Outdoor JUMPS Performances 2015-2022



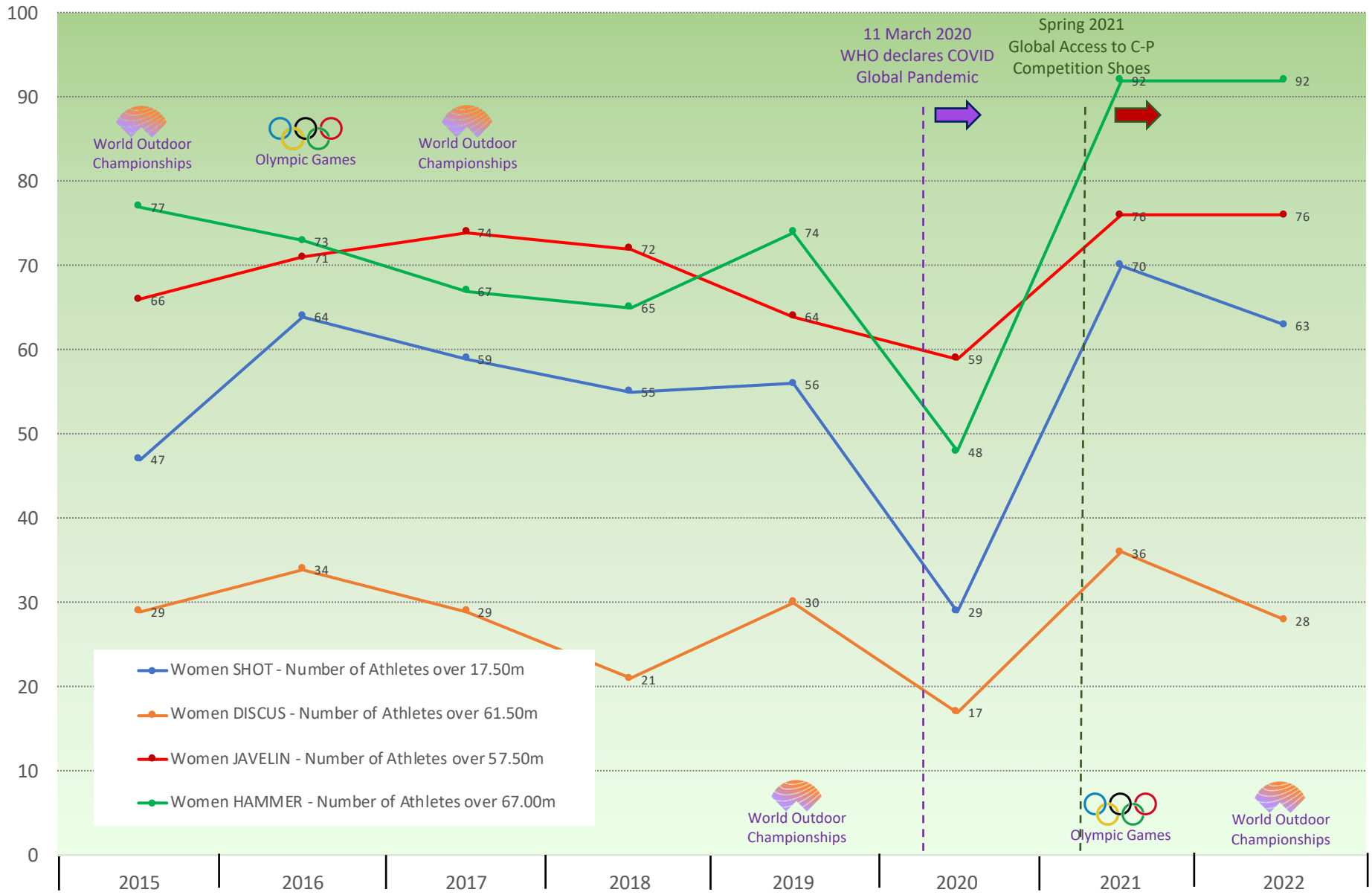
World Athletics - Women Outdoor JUMPS Performances 2015-2021



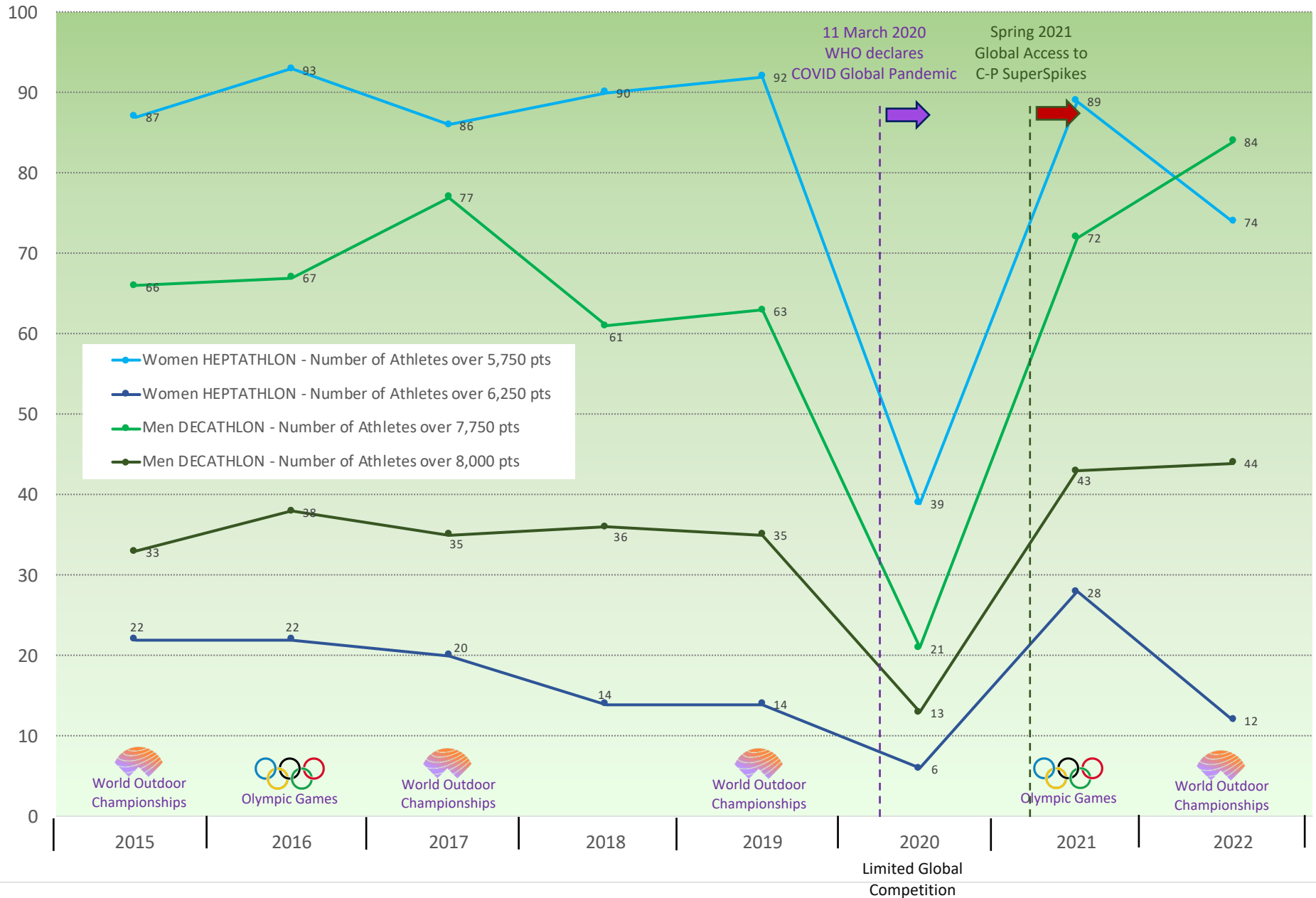
World Athletics - Men Outdoor THROWS Performances 2015-2022



World Athletics - Women Outdoor THROWS Performances 2015-2021



World Athletics - Men & Women COMBINED EVENTS Performances 2015-2022



World Athletics Data

World Athletics Data was used in the preparation of this Report

Sourced from the Public Website

<https://worldathletics.org/stats-zone>