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It's never too late to become an Ironman - The example of an 85-year-old triathlete

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Abstract

This study aimed to analyse the performance of Hiromu Inada (HI), an 85-year-old triathlete, who became the oldest athlete in the world to complete the famous Hawaii Ironman triathlon consisting of a 3.8km swim, 180-km cycle and 42-km run. HI swam in 1 h 51 min, cycled in 8 h 02 min, ran in 6 h 28 min and took 31 min for his transitions, for a total time of 16 h 53 min. Compared to the winner's speed, HI was 55, 47 and 58% slower in swimming, cycling and running, respectively. For the same age-group category (i.e. 85-89 years), the agerelated decline in performances of HI are more pronounced compared to the age-related decline in performance of shorter duration endurance single discipline such as 1500-m swimming, 1-h track cycling or marathon running. To our knowledge, the performance of HI represents the first written observation of a master athlete older than 85 years old who officially finished an ultra-endurance event. The HI case is a clear example that humans can retain remarkable functionality until the end of their life span··· if they train for it.

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ARTICLE

It's never too late to become an Ironman – The example of an 85-year-old triathlete

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Abstract – This study aimed to analyse the performance of Hiromu Inada (HI), an 85-year-old triathlete, who became the oldest athlete in the world to complete the famous Hawaii Ironman triathlon consisting of a 3.8 km swim, 180-km cycle and 42-km run. HI swam in 1 h 51 min, cycled in 8 h 02 min, ran in 6 h 28 min and took 31 min for his transitions, for a total time of 16 h 53 min. Compared to the winner's speed, HI was 55, 47 and 58% slower in swimming, cycling and running, respectively. For the same age-group category (*i.e.* 85–89 years), the age-related decline in performances of HI are more pronounced compared to the age-related decline in performance of shorter duration endurance single discipline such as 1500-m swimming, 1-h track cycling or marathon running. To our knowledge, the performance of HI represents the first written observation of a master athlete older than 85 years old who officially finished an ultra-endurance event. The HI case is a clear example that humans can retain remarkable functionality until the end of their life span... if they train for it.

Key words: master athlete, aging, triathlon, endurance, running

Résumé – Il n'est jamais trop tard pour devenir un Ironman – L'exemple d'un triathlète de 85 ans. Cette étude avait pour but d'analyser la performance de Hiromu Inada (HI), un triathlète de 85 ans, qui est devenu l'athlète le plus âgé au monde à terminer le célèbre triathlon Ironman d'Hawaii composé de 3,8 km de natation, 180 km de cyclisme et 42 km de course à pied. HI a nagé en 1 h 51 min, roulé en 8 h 02 min, couru en 6 h 28 min et a pris 31 min pour ses transitions, pour un temps total de 16 h 53 min. Par rapport à la vitesse du vainqueur, HI était respectivement 55, 47 et 58 % plus lent en natation, cyclisme et course à pied. Pour la même catégorie d'âge (*i.e.* 85–89 ans), la baisse des performances de HI liée à l'âge est plus prononcée comparativement à la baisse des performances liée à l'âge lors épreuves d'endurance de plus courte durée comme le 1500 m en natation, le record de heure sur piste en cyclisme ou le marathon. La performance de HI représente à notre connaissance la première observation dans la littérature d'un athlète master de plus de 85 ans ayant terminé officiellement une épreuve d'ultra-endurance. Le cas HI est un exemple que les êtres humains peuvent conserver une fonctionnalité remarquable jusqu'à la fin de leur vie... s'ils s'entraînent pour cela.

Mots clés : athlète master, vieillissement, triathlon, endurance, course à pied

1 Introduction

Masters athletes (age > 40 years) are known to show a delayed decline in age-related performance (Lepers & Stapley, 2016). The improvement in performance observed among masters athletes over the past few decades is more marked for the older age groups (Lepers & Cattagni, 2012; Lepers, Rüst, Stapley, & Knechtle, 2013). In the field of endurance, the performances of octogenarian athletes such as Canada's Ed Whitlock who ran a marathon at the age of 80 in 3 h 15 min, are exceptional (Lepers & Cattagni, 2018). The Ironman triathlon, which combines three disciplines (3.8 km swimming, 180 km cycling and 42 km running), is a very challenging ultra-endurance event (Lepers, 2008). On October 14th 2018, the 85-year-old Japanese Hiromu Inada (HI) became the oldest athlete in the world to complete Hawaii's famous Ironman triathlon in 16 h 53 min. This performance is quite exceptional and to our

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Table 1. Time performances (h:min:s) of HI at the Hawaii Ironman triathlon.

Age (years)	79 (2012)	80 (2013)	81 (2014)	82 (2015)	83 (2016)	84 (2017)	85 (2018)
Total	15:38:25	17:05:04*	DNF	DNF	16:49:13	DNF	16:53:49
3.8 km swim	1:49:34	1:47:44	1:45:41	1:43:52	1:41:54	1:44:31	1:51:25
Transition 1	0:11:30	0:11:24	0:13:56	0:13:51	0:10:03	0:16:12	0:12:08
180 km cycle	7:42:08	8:13:00	–	8:10:25	8:06:10	–	8:02:49
Transition 2	0:13:22	0:10:24	–	0:18:11	0:17:05	–	0:19:19
42 km run	5:41:51	6:42:32	–	–	6:34:01	–	6:28:17

*: Unofficial performance, the cut off time for the Hawaii Ironman triathlon being 17 h. DNF: Did not finish.

knowledge represents the first official performance of an 85-year-old athlete in an endurance event exceeding 15 h.

The aim of this study was to analyse the performance of this 85-year-old triathlete by examining his performances in the three Ironman disciplines, and comparing them to those of athletes of the same age but in other endurance events of a shorter duration.

2 Methods

2.1 Participant

HI retired at age 60, and began swimming at a gym near his house to maintain his health. Starting at age 65, he has competed in four aquathlons, events that combine swimming and running. He bought himself a road bike at age 69, and at 70 completed his first triathlon. He began entering triathlon competitions of longer distance and duration until he reached the Ironman distance.

He participated in his first Ironman triathlon in Japan at the age of 76 but on that day he failed to make the 17-h time cut off to begin the marathon distance run. He officially finished his first Ironman in Korea in less than 16 h at the age of 78 and qualified for the Ironman World Championship in Hawaii. Unfortunately, for this first attempt in Hawaii, he was stopped during the swim due to a sudden hyperpnoea. Next year at the age of 79, he earned a slot for Hawaii after winning this age-group category at the Ironman 70.3 Asia-Pacific Championship in Phuket. He successfully finished his first Hawaii Ironman triathlon in 2012 at the age of 79. Since 2012, he has competed every year in Hawaii where he had three successful finishes and three races that he abandoned (DNF, see Tab. 1). Since October 2018, at 85 years old, HI holds the record as the oldest person to complete in an Ironman.

Data were collected from the following websites of the international associations or federations: http://eu.ironman.com for the Hawaii Ironman triathlon, http://archives.fina.org/H2O/docs/masters/wrtop10/WRLSCM.pdf for swimming, https://todaycycling.com/record-de-lheure-battu-pour-gilbert-douillard-86-ans for cycling and https://world-masters-athletics.com for running.

The data, initially presented as time performances, were recalculated as average speeds for each discipline of triathlon or event. Within each discipline of triathlon, the age-related declines in performance were expressed using as a ratio calculated between the performances of the best ever performer of each 5-year age group and the performance of the elite category *i.e.* age-group 18–39 years. The Ironman performances of HI was also compared to the world best performances for the same age-group 85–89 years in single events such as: 1500 m swimming, 1-h track cycling and marathon running. Swimming and running can be compared with isolated performances of the same duration, but unfortunately this is not the case with cycling, as there are no 180 km cycling competitions. Within each event, the decline in performance of the best athlete in the age-group 85–89 years was expressed as a percentage of the world record for that event, as follows:

Decline in performance (%) = (Performance at 85–89 yrs − World Record) / World Record × 100.

Because the present study is only based on the actual world best performances achieved in the different age-groups, it was not possible to perform a rigorous statistical analysis. Therefore, the results and their interpretations are the result only of a descriptive analysis.

3 Results

At the age of 85, HI finished the Hawaii Ironman triathlon in a time of 16:53:49. The swimming, cycling, running and transition parts represented 11, 48, 38 and 3%, respectively of the total time (Tab. 2). By comparison, the swimming, cycling, running and transition parts represented 11, 54, 34 and 1% respectively of the total time for the overall winner who finished in 7:52:39.

Figure 1 shows the age-related declines in the three disciplines at the Hawaii Ironman triathlon based on each age-group total time record holder. After 70 years old, the

Table 2. Overview of the 85-year old men athlete performances compared with the respective world records in Hawaii Ironman triathlon, marathon running, 1500-m swimming and 1-h track cycling.

	85-year old performers	World Record Holders	Speed change (%)
Hawaii Ironman	*H. Inada*	*P. Lange*	
3.8 km swim	1:51:25	0:50:37	−55
180 km cycle	8:02:49	4:16:04	−47
42 km run	6:28:17	2:41:31	−58
Total	16:53:49	7:52:39	−53
Running	*E. Whitlock*	*E. Kipchoge*	
Marathon	3:56:34	2:01:39	−49
Swimming	*K. Suzuki*	*Y. Sun*	
1500 m	0:27:47	0:14:31	−48
Cycling	*G. Douillard*	*B. Wiggins*	
1-h Track (km)	34 095	54 526	−37

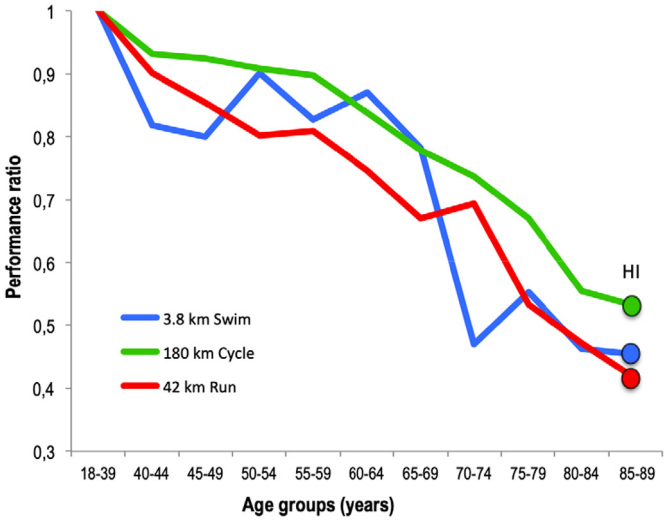

Fig. 1. Age-related declines for swimming, cycling and running at the Hawaii Ironman triathlon. Data are based on each age-group total time record holder in 2018.

age-related decline appears less pronounced for cycling than for swimming and running. In comparison to the young records, HI was 47% slower in cycling but 55 and 58% slower in swimming and running, respectively.

Compared to world best performances of the same age-group category (*i.e.* 85–89 years) in single endurance events but of shorter duration, it appears that the age-related declines in performance are more pronounced for HI regardless of the discipline *i.e.* 1500-m swimming, 1-h track cycling or marathon running (Tab. 2).

4 Discussion

The performance of HI who finished the Hawaii Ironman triathlon in less than 17 h at the age of 85 years is exceptional and to our knowledge represents the first written account of a master athlete older than 85 years old who officially finished an ultra-endurance event. It should be highlighted that since this athlete is the only one in the category over 85 to complete an Ironman triathlon, he is not representative of the strongest performance in the category compared to other single disciplines where much more athletes compete.

Previous studies have already described the exceptional endurance performances of athletes over 80 or even 100 years old in the field of athletics, swimming or cycling (*e.g.* 1-hour record), (Lepers & Cattagni, 2018; Lepers, Stapley, & Cattagni, 2016). One of the most remarkable is that of the cyclist Robert Marchand, who cycled 26.92 km in one hour at the age of 102 (Lepers, *et al.*, 2016). However, there is little data on the performance of athletes aged 85 and over for events longer than 2 h, except for the marathon. The record in the 85–89 years age category belongs to Canadian athlete Ed Whitlock who ran a marathon in 3 h 56 min at the age of 85. A recent case study also reported that a 95-year old man was able to run during 12 h for a total distance of 53 km (Knechtle, Jastrzebski, Rosemann, Pantelis, & Nikolaidis, 2019).

In comparison to the world records, the age-related declines in performance of HI in the three disciplines of triathlon and in total time are more pronounced than those observed for the same age (*i.e.* at 85 years) old for 1500-m swimming, 1-h cycling and marathon running. Several factors could explain these relative lower performances for HI. Firstly, HI trains in three disciplines and does not have a specific focused training in one discipline as master swimmers, cyclists or runners have. Secondly, the combination of three disciplines and exercise-induced fatigue could explain the greater age-related decline in marathon running performance during Ironman triathlon compared to marathon running alone. Thirdly, event duration may exert an influence on the age-related decline in performance, especially when we compare endurance events ranging between 30 min and 4 h and ultra-endurance event such Ironman triathlon lasting around 17 h. Lepers, Sultana, Bernard, Hausswirth, & Brisswalter (2010) showed that the magnitude of the declines in cycling and running performances with advancing age (until 70 years of age) at Olympic Triathlon (~3 h) was less pronounced than at Ironman triathlon (~15 h). Greater muscular fatigue following dynamic contractions (Christie, Snook, & Kent-Braun, 2011; Krüger, Aboodarda, Samozino, Rice, & Millet, 2018), lower resistance to muscle damage and slower recovery (Close,

Kayani, Vasilaki, & McArdle, 2005; Fell & Williams, 2008; Lavender & Nosaka, 2006), and alterations in substrate oxidation with advancing age (Mittendorfer & Klein, 2001) could explain in part the greater age-related decline in Ironman performances compared to shorter endurance performances even if these assumptions need to be verified in the context of ultra-endurance events.

Interestingly, the age-related decline in HI performances appeared less pronounced for 180-km cycling compared to 3.8 km swimming and 42-km running. Similar findings have been observed for shorter distance triathlon (Bernard, Sultana, Lepers, Hausswirth, & Brisswalter, 2010; Lepers, *et al.*, 2010) in which the three disciplines are completed in succession but also when swimming, cycling and running performances were performed alone (Lepers, Stapley, & Cattagni, 2018). Several hypotheses have been proposed to explain the smaller decline in cycling performance with advancing age, such as better preservation of cycling efficiency than energy cost of running (Peiffer, Abbiss, Sultana, Bernard, & Brisswalter, 2016), less mechanical constraints (Vleck, Millet, & Alves, 2014), greater muscular fatigue during running (Millet & Lepers, 2004). Moreover, mechanical power output in running depends on the velocity while it depends on third power of velocity in cycling and swimming (Stevenson, Song, & Cooper, 2013). If we assume that the changes in aerobic capacity with age are directly related to the decline in mechanical power, a similar reduction in power output for running and cycling with advancing age would induce a lower reduction in cycling velocity than running velocity. This may also explain, in part, why the magnitude of the decrease in cycling performance with age was less than that for running.

To achieve such level of performance at 85 years of age, HI may benefit from the right genetics (Valenzuela, Morales, Santos-Lozano, & Lucia, 2018), but he is also an example to show that trained master athletes can preserve their physical function despite their advancing age. Regular exercise practice during one's lifetime prevents or at least attenuates the degeneration of muscle mass, cardiorespiratory fitness, and skeletal muscle metabolic status at an advanced age (> 70 years) (for review see Mckendry, Breen, Shad, & Greig, 2018). HI represents the proof that physical exercise should be a cornerstone in the fight against the decline of intrinsic capacity in the oldest-old.

It would be interesting to know how HI trained to prepare an Ironman triathlon. In an interview (Kamada, 2018), HI said he has adopted a hard training schedule of resting only one or two days a week, and on every other day rising at six a.m., practicing hard until four p.m., and going to bed by nine p.m. at the latest. One example of his typical training week is the following: 12 km swim, 380 km cycle, 45 km which corresponds approximately to a 30-hour training week. Even if the following data should be considered with caution, his training volume is in the range of the best elite Ironman triathletes, at least in duration.

In conclusion, the recent performance of HI at the age of 85 at the Hawaii Triathlon in a sport that combines three disciplines requiring nearly 17 h of effort is exceptional and shows that it is never too late to become an Ironman. It raises the question of the limit of performance with age in the field of ultra-endurance. Instead of viewing such older athletes' performances as biological exceptions, why not consider the medically relevant message they convey; that is, humans can retain remarkable functionality until the end of their life span... if they train for it (Valenzuela, Castillo García, Morales, Santos-Lozano, & Lucia, 2019).

References

Bernard, T., Sultana, F., Lepers, R., Hausswirth, C., & Brisswalter, J. (2010). Age related decline in Olympic triathlon performance: Effect of locomotion mode. *Experimental Aging Research, 36*, 1–15.

Christie, A., Snook, E.M., & Kent-Braun, J.A. (2011). Systematic review and meta-analysis of skeletal muscle fatigue in old age. *Medicine & Science in Sports & Exercise, 43*, 568–77 [Review].

Close, G.L., Kayani, A., Vasilaki, A., & McArdle, A. (2005). Skeletal muscle damage with exercise and aging. *Sports Medicine, 35*(5), 413–427.

Fell, J., & Williams, D. (2008). The effect of aging on skeletal-muscle recovery from exercise: Possible implications for aging athletes. *Journal of Aging and Physical Activity, 16*, 97–115 [Review].

Kamada, Y. (2018). Available from https://www.govonline.go.jp/eng/publicity/book/hlj/html/201809/201809_02_en.html.

Knechtle, B., Jastrzebski, Z., Rosemann, T., Pantelis, T., & Nikolaidis, P.T. (2019). Pacing during and physiological response after a 12-hour ultra marathon in a 95-year-old male runner. *Frontiers in Physiology, 4*(9), 1875.

Krüger, R.L., Aboodarda, S.J., Samozino, P., Rice, C.L., & Millet, G.Y. (2018). Isometric versus dynamic measurements of fatigue: Does age matter? A meta-analysis. *Medicine & Science in Sports & Exercise, 50*(10), 2132–2144 [Review].

Lavender, A.P., & Nosaka, K. (2006). Comparison between old and young men for changes in makers of muscle damage following voluntary eccentric exercise of the elbow flexors. *Applied Physiology, Nutrition, and Metabolism, 31*(3), 218–25.

Lepers, R. (2008). An analysis of Hawaii Ironman performances in elite triathletes from 1981 to 2007. *Medicine & Science in Sports & Exercise, 40*, 1828–1834.

Lepers, R., & Cattagni, T. (2012). Do older athletes reach limits in their performance during marathon running? *Age (Dordrecht), 34*, 773–781.

Lepers, R., & Cattagni, T. (2018). Age-related decline in endurance running performance – An example of a multiple World records holder. *Applied Physiology, Nutrition, and Metabolism, 43*, 98–100.

Lepers, R., & Stapley, P.J. (2016). Master athletes are extending the limits of human endurance. *Frontiers in Physiology, 12* (7), 613 [Review].

Lepers, R., Sultana, F., Bernard, T., Hausswirth, C., & Brisswalter, J. (2010). Age-related changes in triathlon performances. *Internationale Journal of Sports Medicine, 31*, 251–256.

Lepers, R., Rüst, C., Stapley, P., & Knechtle, B. (2013). Relative improvements in endurance performance with age: Evidence from 25 years of Hawaii Ironman racing. *Age (Dordrecht), 35*, 953–962.

Lepers, R., Stapley, P.J., & Cattagni, T. (2016). Centenarian athletes: Examples of ultimate human performance? *Age & Ageing, 45*(5), 732–736.

Lepers, R., Stapley, P.J., & Cattagni, T. (2018). Age-related changes in endurance performance vary between modes of locomotion in men: An analysis of master world records. *International Journal of Sports Physiology and Performance, 13*(3), 394–397.

Mckendry, J., Breen, L., Shad, B.J., & Greig, C. (2018). Muscle morphology and performance in master athletes: A systematic review and meta-analyses. *Ageing Research Reviews, 45*, 62–82.

Millet, G.Y., & Lepers, R. (2004). Alterations of neuromuscular function after prolonged running, cycling and skiing exercises. *Sports Medicine, 34*(2), 105–16 [Review].

Mittendorfer, B., & Klein, S. (2001). Effect of aging on glucose and lipid metabolism during endurance exercise. *International Journal of Sport Nutrition and Exercise Metabolism, 11*, S86–91.

Peiffer, J., Abbiss, C.R., Sultana, F., Bernard, T., & Brisswalter, J. (2016). Comparison of the influence of age on cycling efficiency and the energy cost of running in well-trained triathletes. *European Journal of Applied Physiology, 116*(1), 195–201.

Stevenson, J.L., Song, H., & Cooper, J.A. (2013). Age and sex differences pertaining to modes of locomotion in triathlon. *Medicine & Science in Sports & Exercise, 45*(5), 976–984.

Valenzuela, P.L., Morales, J.S., Santos-Lozano, A., & Lucia, A. (2018). Centenarians breaking records: Nature or nurture? *Age and Ageing, 47*(5), 761–762.

Valenzuela, P.L., Castillo García, A., Morales, J.S., Santos-Lozano, A., & Lucia, A. (2019). Athletic "oldest-old": Alive and kicking. *Journal of the American Medical Directors Association,* pii: S1525-8610(19)30326-3. DOI: 10.1016/j.jamda.2019.03.031.

Vleck, V., Millet, G.P., & Alves, F.B. (2014). The impact of triathlon training and racing on athletes' general health. *Sports Medicine, 44*(12), 1659–1692.

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