

2019 Women's 400m Hurdles World Record Season

UPDATED
2021.08.25

Dalilah Muhammad (USA) - 52.16

Hurdle Touchdown Times



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Todd Henson

2019 Women's 400m Hurdles World Record Season

Dalilah Muhammad (USA) - 52.16

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Notes:

- The times listed as TV Analysis are taken from [youtube.com](https://www.youtube.com) videos and generally coming from Television broadcasts. These are not always the best angles or coverage for getting times. They are often trying to tell a story by focusing on one athlete, and sometimes while shifting camera angles an extra frame can get added or removed.
- Where times are taken from the first movement, instead of the gun, there is at least a ± 0.12 second difference/error. This will show up from the start to the first hurdle and then from hurdle 10 to the finish. The between hurdle intervals should be fairly consistent, but there is still the usual ± 0.03 second
- Data errors, missing data, spelling mistakes, anything that need correction - please let me know. As always, I try to put together the most complete and accurate report possible.
- I have done the best I could, I hope people find it useful or at least interesting.

2019 Women's 400m Hurdles World Record Season - Dalilah Muhammad (USA) (1990)

2019 IAAF World Championships (Doha, QAT) (TV Analysis)

| FINAL | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|------|
| | | 04-Oct-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
| Muhammad, Dalilah (USA) (1990) | time | | 6.19 | 10.11 | 14.23 | 18.49 | 22.86 | 27.24 | 31.72 | 36.39 | 41.21 | 46.23 | | 52.16 | 6 / 1 | | | | |
| | reaction time | 0.200 | interval | 3.92 | 4.12 | 4.26 | 4.37 | 4.38 | 4.48 | 4.67 | 4.82 | 5.02 | 5.93 | WR | | 12.30 | 13.23 | 14.51 | |
| | | | velocity | 7.27 | 8.93 | 8.50 | 8.22 | 8.01 | 7.99 | 7.81 | 7.49 | 7.26 | 6.97 | 6.75 | 7.67 | | 8.54 | 7.94 | 7.24 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 180 | | | | | |

Semi-Final 1

| Semi-Final 1 | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|
| | | 02-Oct-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
| Muhammad, Dalilah (USA) (1990) | time | | 6.14 | 10.07 | 14.25 | 18.55 | 23.08 | 27.63 | 32.36 | 37.30 | 42.37 | 47.64 | | 53.91 | 5 / 1 | | | |
| | reaction time | 0.167 | interval | 3.93 | 4.18 | 4.30 | 4.53 | 4.55 | 4.73 | 4.94 | 5.07 | 5.27 | 6.27 | | | 12.41 | 13.81 | 15.28 |
| | | | velocity | 7.33 | 8.91 | 8.37 | 8.14 | 7.73 | 7.69 | 7.40 | 6.90 | 6.64 | 6.38 | 7.42 | | 8.46 | 7.60 | 6.87 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 19.2 | 180.2 | | | | |

Heat 3

| Heat 3 | | date | Henson (2021) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|
| | | 01-Oct-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
| Muhammad, Dalilah (USA) (1990) | time | | 6.24 | 10.28 | 14.60 | 18.96 | 23.56 | 28.40 | 33.24 | 38.20 | 43.44 | 48.68 | | 54.87 | 5 / 1 | | | |
| | reaction time | 0.194 | interval | 4.04 | 4.32 | 4.36 | 4.60 | 4.84 | 4.84 | 4.96 | 5.24 | 5.24 | 6.19 | | | 12.72 | 14.28 | 15.44 |
| | | | velocity | 7.21 | 8.66 | 8.10 | 8.03 | 7.61 | 7.23 | 7.23 | 7.06 | 6.68 | 6.46 | 7.29 | | 8.25 | 7.35 | 6.80 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 19.2 | 179.2 | | | | |

2019 Weltklasse (Zürich, SUI) (TV Analysis)

| FINAL | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|
| | | 29-Aug-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
| Muhammad, Dalilah (USA) (1990) | time | | 6.24 | 10.20 | 14.48 | 19.06 | 23.64 | 28.22 | 32.78 | 37.54 | 42.46 | 47.48 | | 54.13 | 4 / 3 | | | |
| | reaction time | 0.193 | interval | 3.96 | 4.28 | 4.58 | 4.58 | 4.58 | 4.56 | 4.76 | 4.92 | 5.02 | 6.65 | | | 12.82 | 13.72 | 14.70 |
| | | | velocity | 7.21 | 8.84 | 8.18 | 7.64 | 7.64 | 7.68 | 7.35 | 7.11 | 6.97 | 6.02 | 7.39 | | 8.19 | 7.65 | 7.14 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 19.5 | 180.5 | | | | |

2019 USATF National Championships (Des Moines, IA)

| FINAL | | date | Vazel (2019) - statistical analysis and historical context of the new 400H world record | | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|------|
| | | 28-Jul-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
| Muhammad, Dalilah (USA) (1990) | time | | 6.25 | 10.15 | 14.27 | 18.48 | 22.79 | 27.19 | 31.66 | 36.39 | 41.26 | 46.32 | | 52.20 | 4 / 1 | | | | |
| | reaction time | 0.287 | interval | 3.90 | 4.12 | 4.21 | 4.31 | 4.40 | 4.47 | 4.73 | 4.87 | 5.06 | 5.88 | WR | | 12.23 | 13.18 | 14.66 | |
| | | | velocity | 7.20 | 8.97 | 8.50 | 8.31 | 8.12 | 7.95 | 7.83 | 7.40 | 7.19 | 6.92 | 6.80 | 7.66 | | 8.59 | 7.97 | 7.16 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 20 | 181 | | | | | |

Heat 2

| Heat 2 | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|--------------------------|----|----|----|----|----|----|----|-----|--------|---------------|--------------|-------|-------|--------|
| | | 27-Jul-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
| Muhammad, Dalilah (USA) (1990) | time | | | | | | | | | | | | | 54.22 | 7 / 1 | | | |
| | reaction time | 0.381 | interval | No Information Available | | | | | | | | | | | | | | |
| | | | velocity | | | | | | | | | | | | | | | |
| | H1 lead leg | | strides | | | | | | | | | | | | | | | |

2019 Bislett Games (Oslo, NOR) (TV Analysis)

| FINAL | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|------|
| | | 13-Jun-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
| Muhammad, Dalilah (USA) (1990) | time | | 6.10 | 10.04 | 14.20 | 18.58 | 23.12 | 27.72 | 32.40 | 37.28 | 42.44 | 47.88 | | 54.35 | 5 / 2 | | | | |
| | reaction time | 0.205 | interval | 3.94 | 4.16 | 4.38 | 4.54 | 4.60 | 4.68 | 4.88 | 5.16 | 5.44 | 6.47 | | | 12.48 | 13.82 | 15.48 | |
| | | | velocity | 7.38 | 8.88 | 8.41 | 7.99 | 7.71 | 7.61 | 7.48 | 7.17 | 6.78 | 6.43 | 6.18 | 7.36 | | 8.41 | 7.60 | 6.78 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 17 | 20.5 | 181.5 | | | | | |

2019 Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis)

| FINAL | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|
| | | 06-Jun-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
| Muhammad, Dalilah (USA) (1990) | time | | 6.24 | 10.26 | 14.58 | 19.10 | 23.76 | 28.40 | 33.00 | 37.68 | 42.58 | 47.70 | | 53.67 | 5 / 1 | | | |
| | reaction time | 0.147 | interval | 4.02 | 4.32 | 4.52 | 4.66 | 4.64 | 4.60 | 4.68 | 4.90 | 5.12 | 5.97 | | | 12.86 | 13.90 | 14.70 |
| | | | velocity | 7.21 | 8.71 | 8.10 | 7.74 | 7.51 | 7.54 | 7.61 | 7.14 | 6.84 | 6.70 | 7.45 | | 8.16 | 7.55 | 7.14 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 19.5 | 178.5 | | | | |

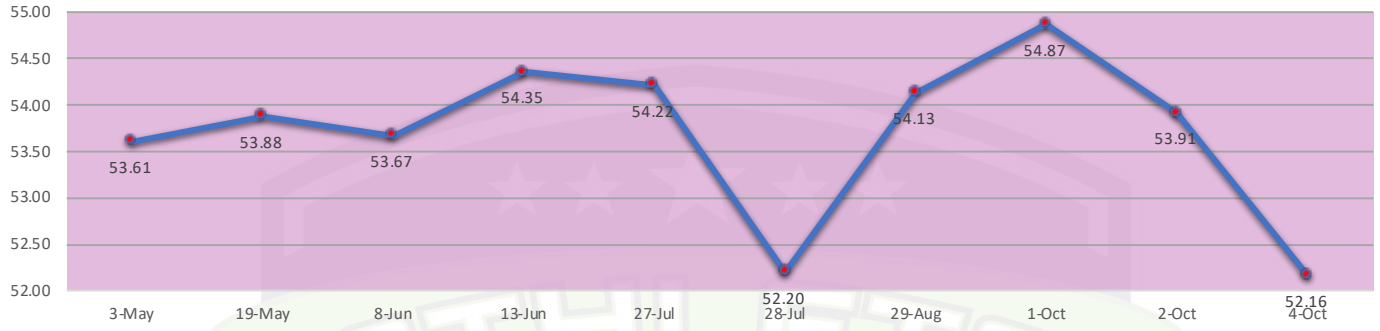
2019 Seiko Golden Grand Prix (Osaka, JPN) (TV Analysis)

| FINAL | | date | Hirokawa (2019) - research on athlete performance and technique- 2019 data book | | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|------|
| | | 19-May-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
| Muhammad, Dalilah (USA) (1990) | time | | 6.21 | 10.23 | 14.51 | 18.94 | 23.47 | 28.16 | 32.75 | 37.49 | 42.46 | 47.80 | | 53.88 | 5 / 1 | | | | |
| | reaction time | 0.181 | interval | 4.02 | 4.28 | 4.43 | 4.53 | 4.69 | 4.59 | 4.74 | 4.97 | 5.34 | 6.08 | | | 12.73 | 13.81 | 15.05 | |
| | | | velocity | 7.25 | 8.71 | 8.18 | 7.90 | 7.73 | 7.46 | 7.63 | 7.38 | 7.04 | 6.55 | 6.58 | 7.42 | | 8.25 | 7.60 | 6.98 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 180 | | | | | |

2019 Doha Diamond League (Doha, QAT) (TV Analysis)

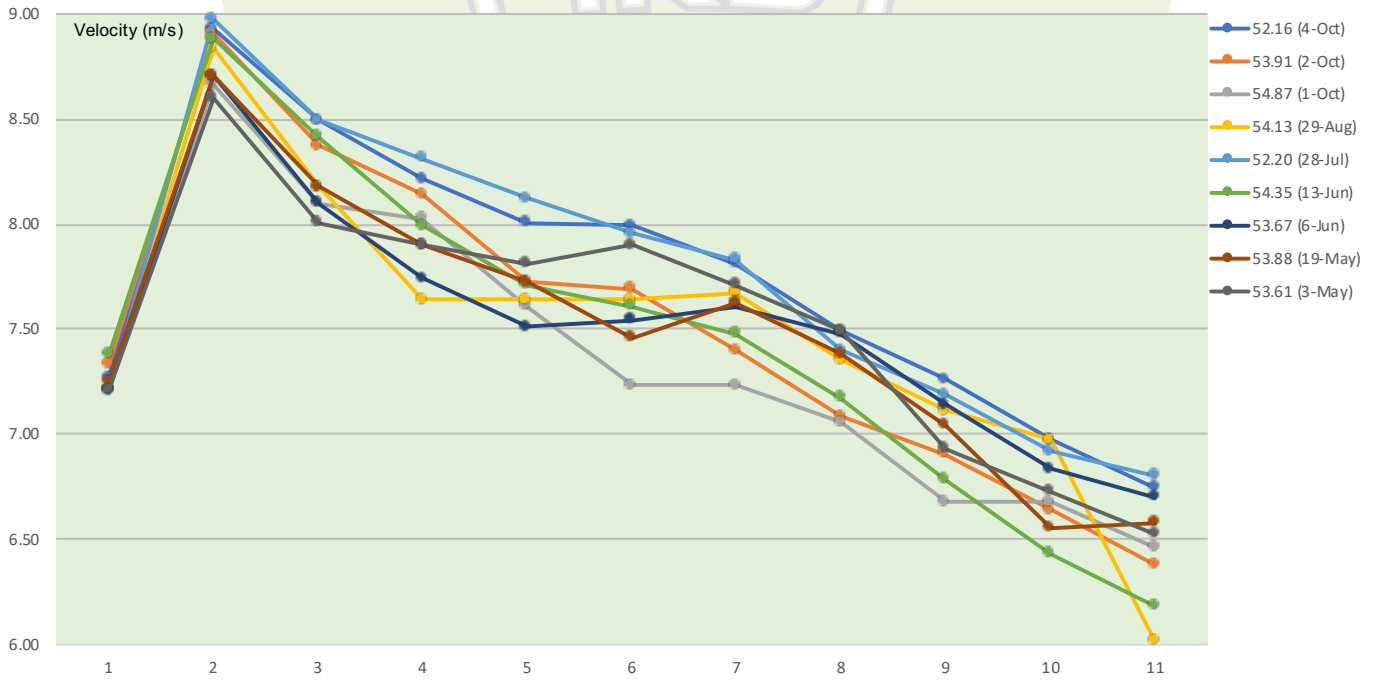
| FINAL | | date | Henson (2020) - Athlete First: 2019 year end hurdle report | | | | | | | | | | | | | | | | |
|--------------------------------|---------------|-----------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|---------------|--------------|-------|-------|--------|------|
| | | 03-May-19 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | Official Time | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
| Muhammad, Dalilah (USA) (1990) | time | | 6.24 | 10.31 | 14.68 | 19.11 | 23.59 | 28.02 | 32.56 | 37.23 | 42.28 | 47.48 | | 53.61 | 5 / 1 | | | | |
| | reaction time | 0.147 | interval | 4.07 | 4.37 | 4.43 | 4.48 | 4.43 | 4.54 | 4.67 | 5.05 | 5.20 | 6.13 | | | 12.87 | 13.45 | 14.92 | |
| | | | velocity | 7.21 | 8.60 | 8.01 | 7.90 | 7.81 | 7.90 | 7.71 | 7.49 | 6.93 | 6.73 | 6.53 | 7.46 | | 8.16 | 7.81 | 7.04 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 180 | | | | | |

Dalilah Muhammad 2019



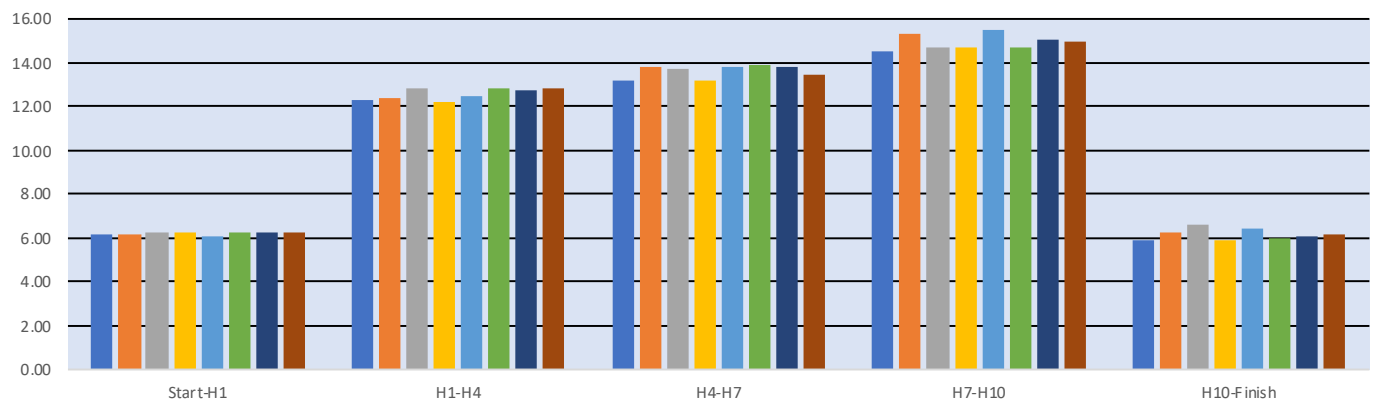
ATHLETE FIRST

Hurdle Rhythmic Units



Time Intervals (s)

Hurdle Phases



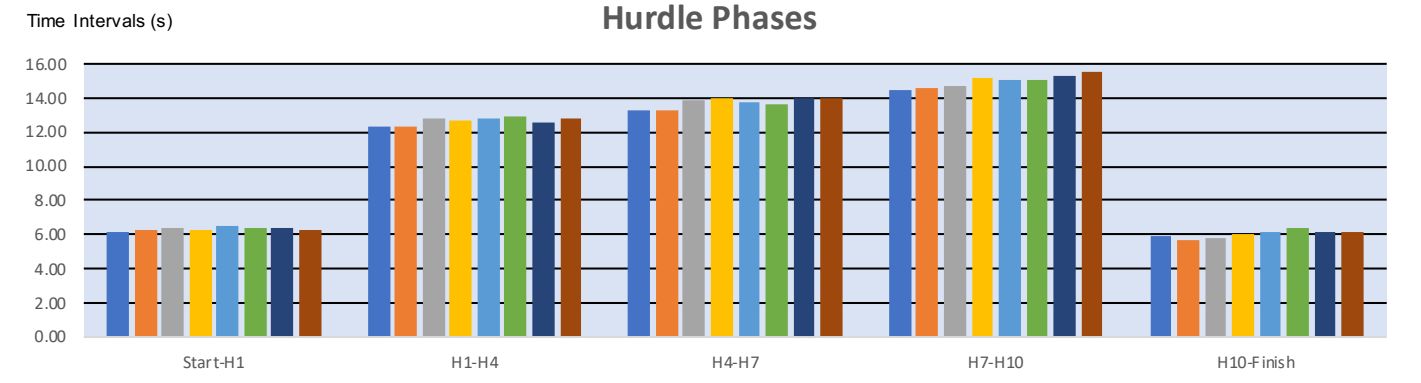
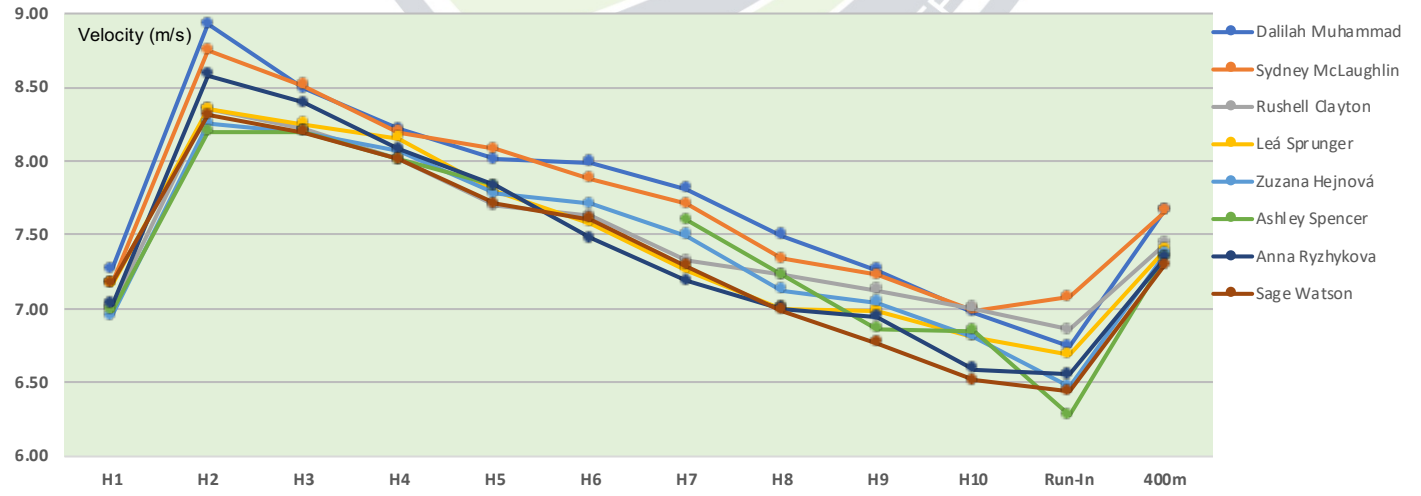
2019 IAAF World Championships (Doha, QAT)

Women's 400m Hurdles

Date 2019.10.04

FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| Muhammad, Dalilah (USA) (1990) | time | 6.19 | 10.11 | 14.23 | 18.49 | 22.86 | 27.24 | 31.72 | 36.39 | 41.21 | 46.23 | 52.16 | 52.16 | 6 / 1 | | | |
| | reaction time | 0.200 | | | | | | | | | | | | | | | |
| | interval velocity | 7.27 | 8.93 | 8.50 | 8.22 | 8.01 | 7.99 | 8.01 | 7.49 | 7.26 | 6.97 | 6.75 | 7.67 | | 12.30 | 13.23 | 14.51 |
| H1 lead leg | R | | | | | | | | | | | | | | 8.54 | 7.94 | 7.24 |
| McLaughlin, Sydney (USA) (1999) | time | 6.27 | 10.27 | 14.38 | 18.65 | 22.98 | 27.42 | 31.96 | 36.73 | 41.57 | 46.58 | 52.23 | 52.23 | 4 / 2 | | | |
| | reaction time | 0.161 | | | | | | | | | | | | | | | |
| | interval velocity | 7.18 | 8.75 | 8.52 | 8.20 | 8.08 | 7.88 | 7.71 | 7.34 | 7.23 | 6.99 | 7.08 | 7.66 | | 12.38 | 13.31 | 14.62 |
| H1 lead leg | R | | | | | | | | | | | | | 8.48 | 7.89 | 7.18 | |
| Clayton, Rushell (JAM) (1992) | time | 6.42 | 10.61 | 14.87 | 19.24 | 23.79 | 28.38 | 33.16 | 38.00 | 42.91 | 47.91 | 53.74 | 53.74 | 5 / 3 | | | |
| | reaction time | 0.137 | | | | | | | | | | | | | | | |
| | interval velocity | 7.01 | 8.35 | 8.22 | 8.01 | 7.69 | 7.63 | 7.32 | 7.23 | 7.13 | 7.00 | 6.86 | 7.44 | | 12.82 | 13.92 | 14.75 |
| H1 lead leg | L | | | | | | | | | | | | | 8.19 | 7.54 | 7.12 | |
| Sprunger, Leá (SUI) (1990) | time | 6.28 | 10.47 | 14.71 | 19.00 | 23.49 | 28.11 | 32.93 | 37.93 | 42.94 | 48.08 | 54.06 | 54.06 | 9 / 4 | | | |
| | reaction time | 0.199 | | | | | | | | | | | | | | | |
| | interval velocity | 7.17 | 8.35 | 8.25 | 8.16 | 7.80 | 7.58 | 7.26 | 7.00 | 6.99 | 6.81 | 6.69 | 7.40 | | 12.72 | 13.93 | 15.15 |
| H1 lead leg | R | | | | | | | | | | | | | 8.25 | 7.54 | 6.93 | |
| Hejnová, Zuzana (CZE) (1986) | time | 6.47 | 10.71 | 14.98 | 19.32 | 23.82 | 28.36 | 33.03 | 37.94 | 42.91 | 48.05 | 54.23 | 54.23 | 8 / 5 | | | |
| | reaction time | 0.141 | | | | | | | | | | | | | | | |
| | interval velocity | 6.96 | 8.25 | 8.20 | 8.06 | 7.78 | 7.71 | 7.49 | 7.13 | 7.04 | 6.81 | 6.47 | 7.38 | | 12.85 | 13.71 | 15.02 |
| H1 lead leg | R | | | | | | | | | | | | | 8.17 | 7.66 | 6.99 | |
| Spencer, Ashley (USA) (1993) | time | 6.44 | 10.71 | 14.98 | 19.35 | 23.82 | 28.36 | 33.03 | 37.87 | 42.97 | 48.08 | 54.45 | 54.45 | 2 / 6 | | | |
| | reaction time | 0.163 | | | | | | | | | | | | | | | |
| | interval velocity | 6.99 | 8.20 | 8.20 | 8.01 | 7.83 | 7.60 | 7.23 | 6.86 | 6.85 | 6.28 | 7.35 | | | 12.91 | 13.68 | 15.05 |
| H1 lead leg | L | | | | | | | | | | | | | 8.13 | 7.68 | 6.98 | |
| Ryzhykova, Anna (UKR) (1989) | time | 6.40 | 10.48 | 14.65 | 18.98 | 23.45 | 28.13 | 33.00 | 38.00 | 43.04 | 48.35 | 54.45 | 54.45 | 3 / 7 | | | |
| | reaction time | 0.173 | | | | | | | | | | | | | | | |
| | interval velocity | 7.03 | 8.58 | 8.39 | 8.08 | 7.83 | 7.48 | 7.19 | 7.00 | 6.94 | 6.59 | 6.56 | 7.35 | | 12.58 | 14.02 | 15.35 |
| H1 lead leg | R | | | | | | | | | | | | | 8.35 | 7.49 | 6.84 | |
| Watson, Sage (CAN) (1994) | time | 6.27 | 10.48 | 14.75 | 19.12 | 23.66 | 28.26 | 33.06 | 38.07 | 43.24 | 48.61 | 54.82 | 54.82 | 7 / 8 | | | |
| | reaction time | 0.186 | | | | | | | | | | | | | | | |
| | interval velocity | 7.18 | 8.31 | 8.20 | 8.01 | 7.71 | 7.61 | 7.29 | 6.99 | 6.77 | 6.52 | 6.44 | 7.30 | | 12.85 | 13.94 | 15.55 |
| H1 lead leg | R | | | | | | | | | | | | | 8.17 | 7.53 | 6.75 | |



Dalilah Muhammad
 Source: Sugimoto, K. (2019). World championship competition performance analysis: Women's hurdles. Bulletin of Studies in Athletics of JAAF, 15, p 19.
 (in Japanese)
https://www.iaaf.or.jp/pdf/about/publish/2019/2019_2-4.pdf

2nd - 8th Places (TV Analysis)
 Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: https://www.youtube.com/watch?v=ZAz0GS_40TY

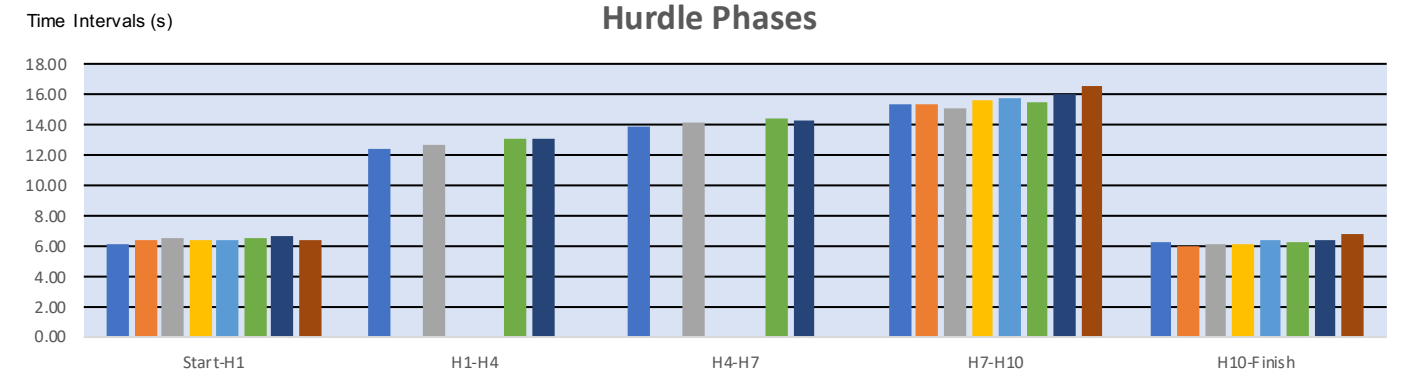
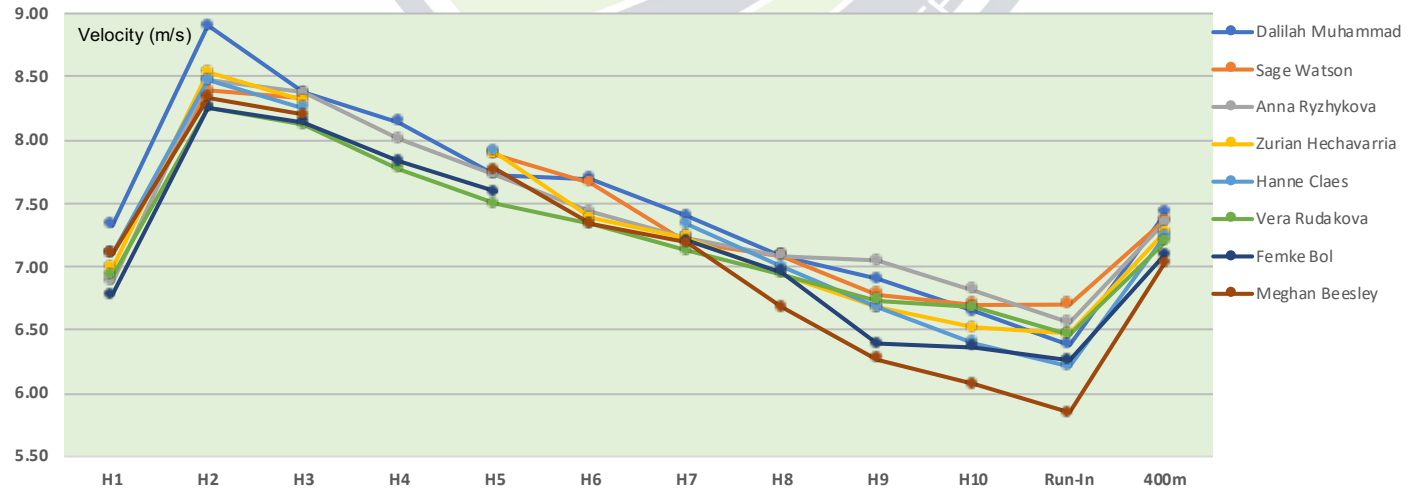
2019 IAAF World Championships (Doha, QAT) (TV Analysis)

Women's 400m Hurdles

Date 2019.10.02

Semi-Final 1

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
|---|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|-------|
| Muhammad, Dalilah (USA) (1990) | time | 6.14 | 10.07 | 14.25 | 18.55 | 23.08 | 27.63 | 32.36 | 37.30 | 42.37 | 47.64 | 53.91 | 53.91 | 5 / 1 | | | | |
| | reaction time | 0.167 | | | | | | | | | | | | | | | | |
| | interval velocity | 7.33 | 8.91 | 8.37 | 8.14 | 7.73 | 7.69 | 7.40 | 7.09 | 6.90 | 6.64 | 6.38 | 7.42 | | 12.41 | 13.81 | 15.28 | |
| H1 lead leg | R | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 19.2 | 180.2 | | 8.46 | 7.60 | 6.87 | |
| Watson, Sage (CAN) (1994) | time | 6.34 | 10.51 | 14.71 | | 23.59 | 28.16 | 33.03 | 37.97 | 43.13 | 48.35 | | 54.32 | 4 / 2 | | | | |
| | reaction time | 0.183 | | | | | | | | | | | | | | | | |
| | interval velocity | 7.10 | 8.39 | 8.33 | | 7.88 | 7.66 | 7.19 | 7.09 | 6.78 | 6.70 | 7.36 | | | | | 15.32 | |
| H1 lead leg | R | 22 | 15 | 15 | | 15 | 15 | 16 | 16 | 16 | 20 | 151 | | | | | 6.85 | |
| Ryzhykova, Anna (UKR) (1989) | time | 6.54 | 10.67 | 14.85 | 19.22 | 23.75 | 28.46 | 33.30 | 38.24 | 43.21 | 48.35 | | 54.45 | 6 / 3 | | | | |
| | reaction time | 0.171 | | | | | | | | | | | | | | | | |
| | interval velocity | 6.88 | 8.47 | 8.37 | 8.01 | 7.73 | 7.43 | 7.23 | 7.09 | 7.04 | 6.81 | 6.56 | 7.35 | | 12.68 | 14.08 | 15.05 | |
| H1 lead leg | R | 22 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 19.2 | 172.2 | | 8.28 | 7.46 | 6.98 | |
| Hechavarria, Zurian (CUB) (1995) | time | 6.44 | 10.54 | 14.75 | | 23.62 | 28.36 | 33.20 | 38.24 | 43.48 | 48.85 | | 55.03 | 7 / 4 | | | | |
| | reaction time | 0.216 | | | | | | | | | | | | | | | | |
| | interval velocity | 6.99 | 8.54 | 8.31 | | 7.89 | 7.38 | 7.23 | 6.94 | 6.68 | 6.52 | 6.47 | 7.27 | | | | 15.65 | |
| H1 lead leg | L | 23 | 15 | 15 | | 16 | 16 | 16 | 17 | 17 | 21.2 | 156.2 | | | | | 6.71 | |
| Claes, Hanne (BEL) (1991) | time | 6.34 | 10.47 | 14.71 | | 23.56 | | 33.10 | 38.10 | 43.34 | 48.81 | | 55.25 | 3 / 5 | | | | |
| | reaction time | 0.159 | | | | | | | | | | | | | | | | |
| | interval velocity | 7.10 | 8.47 | 8.25 | | 7.91 | | 7.34 | 7.00 | 6.68 | 6.40 | 6.21 | 7.24 | | | | | 15.71 |
| H1 lead leg | R | 23 | 15 | 15 | | | | 17 | 17 | 21 | 108 | | | | | | | 6.68 |
| Rudakova, Vera (ANA) (1992) | time | 6.50 | 10.74 | 15.05 | 19.55 | 24.22 | 28.99 | 33.90 | 38.94 | 44.14 | 49.38 | | 55.57 | 8 / 6 | | | | |
| | reaction time | 0.246 | | | | | | | | | | | | | | | | |
| | interval velocity | 6.92 | 8.25 | 8.12 | 7.78 | 7.49 | 7.34 | 7.13 | 6.94 | 6.73 | 6.68 | 6.46 | 7.20 | | 13.05 | 14.35 | 15.48 | |
| H1 lead leg | L | 21 | 15 | 15 | | 15 | 15 | 15 | 16 | 16 | 16 | 144 | | | 8.05 | 7.32 | 6.78 | |
| Bol, Femke (NED) (2000) | time | 6.64 | 10.88 | 15.18 | 19.65 | 24.26 | | 33.97 | 39.00 | 44.48 | 49.98 | | 56.37 | 2 / 7 | | | | |
| | reaction time | 0.219 | | | | | | | | | | | | | | | | |
| | interval velocity | 6.78 | 8.25 | 8.14 | 7.83 | 7.59 | | 9.71 | 5.03 | 5.48 | 5.50 | 6.39 | | | 13.01 | 14.32 | 16.01 | |
| H1 lead leg | L | 22 | 8.25 | 8.14 | 7.83 | 7.59 | | 7.21 | 6.96 | 6.39 | 6.36 | 7.10 | | | 8.07 | 7.33 | 6.56 | |
| H1 lead leg | L | 22 | | | | 15 | | | | 16 | 16 | 69 | | | | | | |
| Beesley, Meghan (GBR) (1989) | time | 6.34 | 10.54 | 14.81 | | 23.82 | 28.59 | 33.46 | 38.70 | 44.28 | 50.05 | | 56.89 | 9 / 8 | | | | |
| | reaction time | 0.173 | | | | | | | | | | | | | | | | |
| | interval velocity | 7.10 | 8.33 | 8.20 | | 9.01 | 4.77 | 4.87 | 5.24 | 5.58 | 5.77 | 6.84 | | | | | | 16.59 |
| H1 lead leg | L | 24 | 16 | 16 | | 16 | | 17 | 17 | 19 | 19 | 127 | | | | | | 6.33 |



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 30fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=vJCe4ANu-0>

2019 IAAF World Championships (Doha, QAT) (TV Analysis)

Women's 400m Hurdles

Date 2019.10.01

Heat 5

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
|-------------------------------|---------------|----------|----------|-------|-------|-------|------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|------|
| Clayton, Rushell (JAM) (1992) | time | 6.60 | 10.76 | 15.04 | 19.36 | 23.88 | | 33.60 | 38.68 | 43.88 | 49.16 | | 55.23 | 7 / 1 | | | | |
| | reaction time | 0.176 | interval | 4.16 | 4.28 | 4.32 | 4.52 | 9.72 | 5.08 | 5.20 | 5.28 | 6.07 | | | 12.76 | 14.24 | 15.56 | |
| | | velocity | 6.82 | 8.41 | 8.18 | 8.10 | 7.74 | | 7.20 | 6.89 | 6.73 | 6.63 | 6.59 | 7.24 | | 8.23 | 7.37 | 6.75 |
| | H1 lead leg | L | strides | 23 | 1'5 | 15 | 15 | 15 | | 16 | 16 | 16 | 19 | 135 | | | | |

Date 2019.10.01

Heat 4

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
|---------------------------|---------------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|------|
| Iuel, Amalie (NOR) (1994) | time | 6.32 | 10.48 | 14.76 | 19.08 | 23.72 | 28.40 | 33.18 | 38.16 | 43.20 | 48.56 | | 54.72 | 5 / 1 | | | | |
| | reaction time | 0.157 | interval | 4.16 | 4.28 | 4.32 | 4.64 | 4.68 | 4.78 | 4.98 | 5.04 | 5.36 | 6.16 | | 12.76 | 14.10 | 15.38 | |
| | | velocity | 7.12 | 8.41 | 8.18 | 8.10 | 7.54 | 7.48 | 7.32 | 7.03 | 6.94 | 6.53 | 6.49 | 7.31 | | 8.23 | 7.45 | 6.83 |
| | H1 lead leg | L | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 19 | 164 | | | | |

Date 2019.10.01

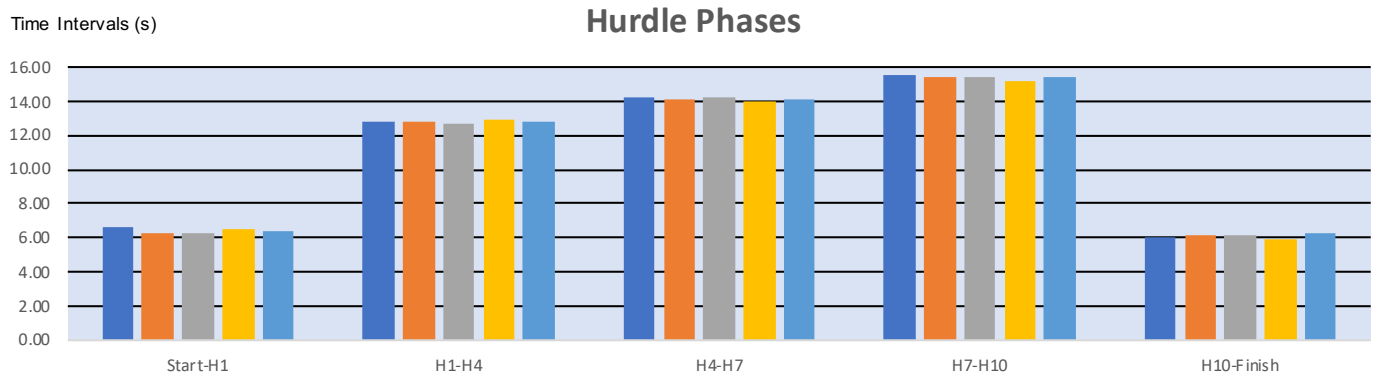
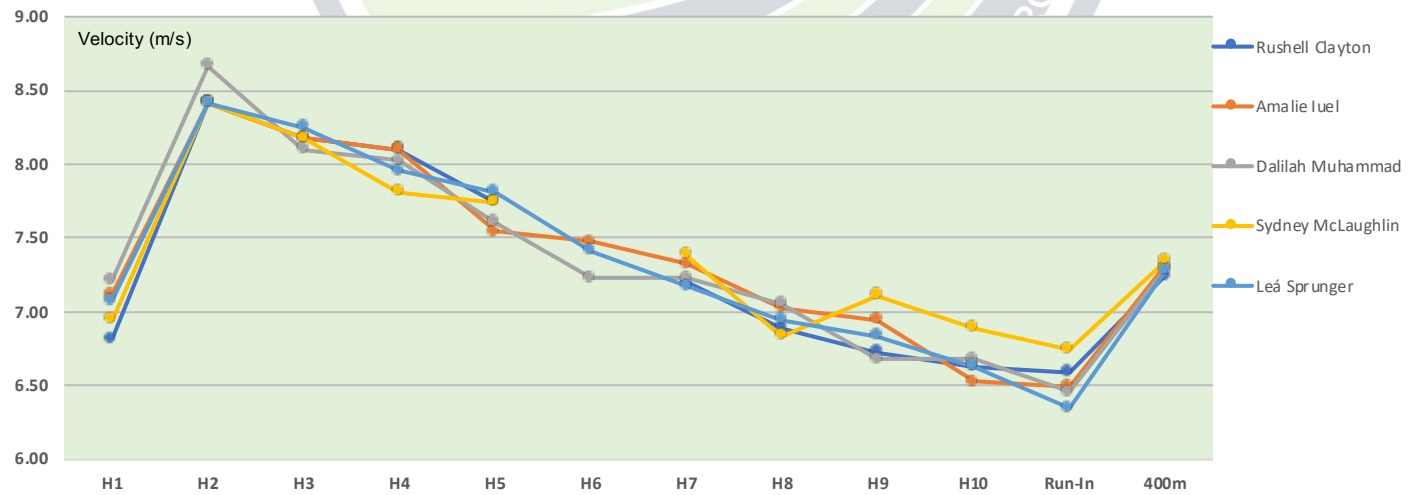
Heat 3

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
|--------------------------------|---------------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|------|
| Muhammad, Dalilah (USA) (1990) | time | 6.24 | 10.28 | 14.60 | 18.96 | 23.56 | 28.40 | 33.24 | 38.20 | 43.44 | 48.68 | | 54.87 | 5 / 1 | | | | |
| | reaction time | 0.194 | interval | 4.04 | 4.32 | 4.36 | 4.60 | 4.84 | 4.84 | 4.96 | 5.24 | 5.24 | 6.19 | | 12.72 | 14.28 | 15.44 | |
| | | velocity | 7.21 | 8.66 | 8.10 | 8.03 | 7.61 | 7.23 | 7.23 | 7.06 | 6.68 | 6.68 | 6.46 | 7.29 | | 8.25 | 7.35 | 6.80 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 19.2 | 179.2 | | | | |

Date 2019.10.01

Heat 1

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 | |
|---------------------------------|---------------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|------|
| McLaughlin, Sydney (USA) (1999) | time | 6.48 | 10.64 | 14.92 | 19.40 | 23.92 | | 33.40 | 38.52 | 43.44 | 48.52 | | 54.45 | 8 / 1 | | | | |
| | reaction time | 0.176 | interval | 4.16 | 4.28 | 4.48 | 4.52 | 9.48 | 5.12 | 4.92 | 5.08 | 5.93 | | | 12.92 | 14.00 | 15.12 | |
| | | velocity | 6.94 | 8.41 | 8.18 | 7.81 | 7.74 | | 7.38 | 6.84 | 7.11 | 6.89 | 6.75 | 7.35 | | 8.13 | 7.50 | 6.94 |
| | H1 lead leg | R | strides | 23 | 15 | 15 | 15 | | 16 | 16 | 16 | 16 | 18.2 | 149.2 | | | | |
| Sprunger, Leá (SUI) (1990) | time | 6.36 | 10.52 | 14.76 | 19.16 | 23.64 | 28.36 | 33.24 | 38.28 | 43.40 | 48.68 | | 54.98 | 4 / 2 | | | | |
| | reaction time | 0.182 | interval | 4.16 | 4.24 | 4.40 | 4.48 | 4.72 | 4.88 | 5.04 | 5.12 | 5.28 | 6.30 | | 12.80 | 14.08 | 15.44 | |
| | | velocity | 7.08 | 8.41 | 8.25 | 7.95 | 7.81 | 7.42 | 7.17 | 6.94 | 6.84 | 6.63 | 6.35 | 7.28 | | 8.20 | 7.46 | 6.80 |
| | H1 lead leg | R | strides | 21 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 19 | 157 | | | | |



Evaluated with: ObjectusVideo
 Quality & Frame Rate: 1920 x 1080 @ 25fps
 Timing From: First Movement
 Source: <https://www.youtube.com/watch?v=U3vPCocLU8E>

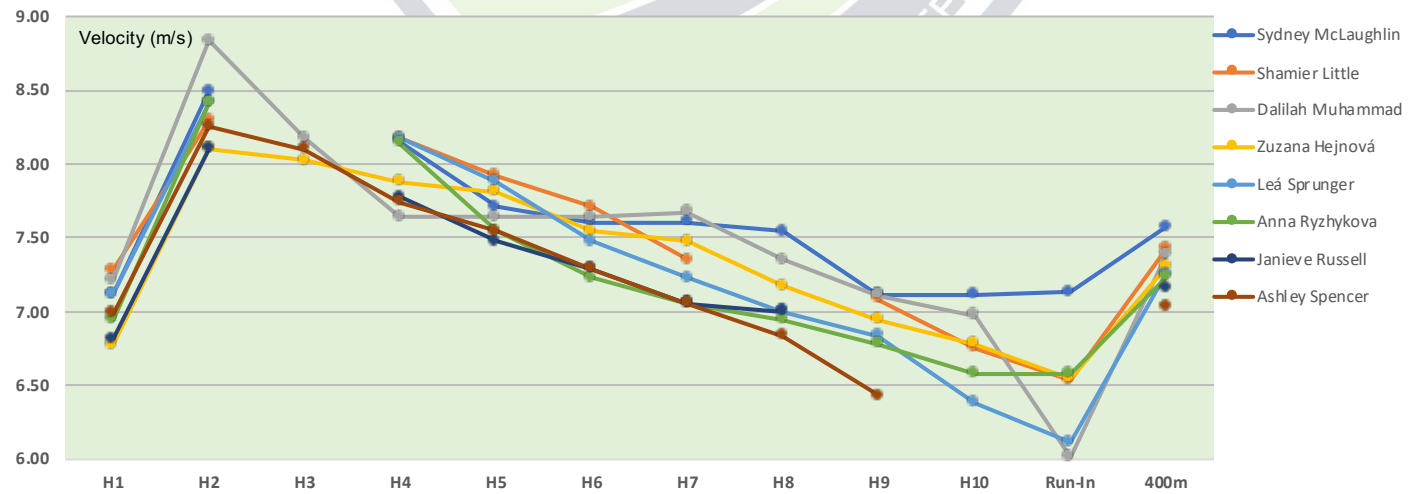
2019 Weltklasse (Zürich, SUI) (TV Analysis)

Women's 400m Hurdles

Date 2019.08.29

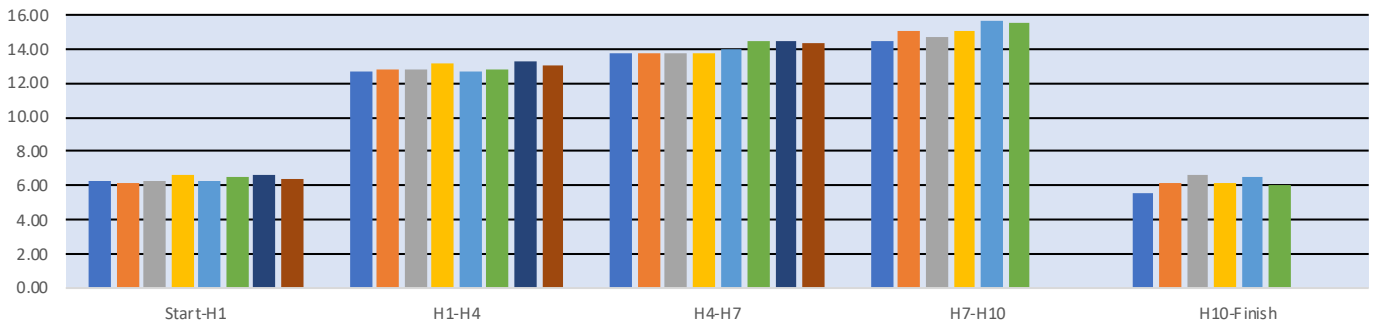
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| McLaughlin, Sydney (USA) (1999) | time | 6.32 | 10.44 | | 19.02 | 23.56 | 28.16 | 32.76 | 37.40 | 42.32 | 47.24 | | 52.85 | 3 / 1 | | | |
| | reaction time | 0.147 | | | | | | | | | | | | | | | |
| | interval | | 4.12 | | 8.58 | 4.54 | 4.60 | 4.60 | 4.64 | 4.92 | 5.61 | | | | 12.70 | 13.74 | 14.48 |
| | velocity | 7.12 | 8.50 | | 8.16 | 7.71 | 7.61 | 7.61 | 7.54 | 7.11 | 7.11 | 7.13 | 7.57 | | 8.27 | 7.64 | 7.25 |
| H1 lead leg | R | | 23 | 15 | | 15 | 15 | 15 | 15 | 16 | 16 | 19 | 149 | | | | |
| Little, Shamier (USA) (1995) | time | 6.18 | 10.40 | | 18.96 | 23.38 | 27.92 | 32.68 | | 42.56 | 47.74 | | 53.86 | 2 / 2 | | | |
| | reaction time | 0.202 | | | | | | | | 9.88 | 5.18 | 6.12 | | | 12.78 | 13.72 | 15.06 |
| | interval | | 4.22 | | 8.56 | 4.42 | 4.54 | 4.76 | | 7.09 | 6.76 | 6.54 | 7.43 | | 8.22 | 7.65 | 6.97 |
| | velocity | 7.28 | 8.29 | | 8.18 | 7.92 | 7.71 | 7.35 | 7.15 | 7.09 | 6.76 | 6.54 | 7.43 | | | | |
| H1 lead leg | L | | 22 | 15 | | 15 | 15 | 15 | | 16 | 20 | 118 | | | | | |
| Muhammad, Dalilah (USA) (1990) | time | 6.24 | 10.20 | 14.48 | 19.06 | 23.64 | 28.22 | 32.78 | 37.54 | 42.46 | 47.48 | | 54.13 | 4 / 3 | | | |
| | reaction time | 0.193 | | | | | | | | 5.02 | 6.65 | 6.02 | 7.39 | | 12.82 | 13.72 | 14.70 |
| | interval | | 3.96 | 4.28 | 4.58 | 4.58 | 4.58 | 4.56 | 4.76 | 4.92 | 5.02 | 6.65 | 6.02 | 7.39 | 8.19 | 7.65 | 7.14 |
| | velocity | 7.21 | 8.84 | 8.18 | 7.64 | 7.64 | 7.64 | 7.68 | 7.35 | 7.11 | 6.97 | 6.02 | 7.39 | | | | |
| H1 lead leg | R | | 23 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 19.5 | 180.5 | | | | |
| Hejnová, Zuzana (CZE) (1986) | time | 6.64 | 10.96 | 15.32 | 19.76 | 24.24 | 28.88 | 33.56 | 38.44 | 43.48 | 48.64 | | 54.75 | 6 / 4 | | | |
| | reaction time | 0.144 | | | | | | | | 5.04 | 5.16 | 6.11 | | | 13.12 | 13.80 | 15.08 |
| | interval | | 4.32 | 4.36 | 4.44 | 4.48 | 4.64 | 4.68 | 4.88 | 5.04 | 5.16 | 6.11 | | | 8.00 | 7.61 | 6.96 |
| | velocity | 6.78 | 8.10 | 8.03 | 7.88 | 7.81 | 7.54 | 7.48 | 7.17 | 6.94 | 6.78 | 6.55 | 7.31 | | | | |
| H1 lead leg | R | | 22 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 180 | | | | | |
| Sprunger, Leá (SUI) (1990) | time | 6.32 | 10.48 | | 19.04 | 23.48 | 28.16 | 33.00 | 38.00 | 43.12 | 48.60 | | 55.14 | 7 / 5 | | | |
| | reaction time | 0.140 | | | | | | | | 5.12 | 5.48 | 6.54 | | | 12.72 | 13.96 | 15.60 |
| | interval | | 4.16 | | 8.56 | 4.44 | 4.68 | 4.84 | 5.00 | 5.12 | 5.48 | 6.54 | | | 8.25 | 7.52 | 6.73 |
| | velocity | 7.12 | 8.41 | | 8.18 | 7.88 | 7.48 | 7.23 | 7.00 | 6.84 | 6.39 | 6.12 | 7.25 | | | | |
| H1 lead leg | R | | 21 | 14 | | 14 | 15 | 15 | | 15 | 16 | 20 | 130 | | | | |
| Ryzhykova, Anna (UKR) (1989) | time | 6.48 | 10.64 | | 19.24 | 23.88 | 28.72 | 33.68 | 38.72 | 43.88 | 49.20 | | 55.28 | 1 / 6 | | | |
| | reaction time | 0.149 | | | | | | | | 5.32 | 6.08 | | | | 12.76 | 14.44 | 15.52 |
| | interval | | 4.16 | | 8.60 | 4.64 | 4.84 | 4.96 | 5.04 | 5.16 | 5.32 | 6.08 | | | 8.23 | 7.27 | 6.77 |
| | velocity | 6.94 | 8.41 | | 8.14 | 7.54 | 7.23 | 7.06 | 6.94 | 6.78 | 6.58 | 6.58 | 7.24 | | | | |
| H1 lead leg | R | | 22 | 14 | | 15 | 15 | 15 | | 15 | 16 | 19.7 | 131.7 | | | | |
| Russell, Janieve (JAM) (1993) | time | 6.60 | 10.92 | | 19.92 | 24.60 | 29.40 | 34.36 | 39.36 | | | | 55.87 | 8 / 7 | | | |
| | reaction time | 0.144 | | | | | | | | 5.00 | | | | | 13.32 | 14.44 | |
| | interval | | 4.32 | | 9.00 | 4.68 | 4.80 | 4.96 | 5.00 | | | | | | 7.88 | 7.27 | |
| | velocity | 6.82 | 8.10 | | 7.78 | 7.48 | 7.29 | 7.06 | 7.00 | | | | 7.16 | | | | |
| H1 lead leg | R | | 23 | 15 | | 15 | 16 | 16 | 16 | | | 101 | | | | | |
| Spencer, Ashley (USA) (1993) | time | 6.44 | 10.68 | 15.00 | 19.52 | 24.16 | 28.96 | 33.92 | 39.04 | 44.48 | | | 56.90 | 5 / 8 | | | |
| | reaction time | 0.132 | | | | | | | | 5.44 | | | | | 13.08 | 14.40 | |
| | interval | | 4.24 | 4.32 | 4.52 | 4.64 | 4.80 | 4.96 | 5.12 | 5.44 | | | | | 8.03 | 7.29 | |
| | velocity | 6.99 | 8.25 | 8.10 | 7.74 | 7.54 | 7.29 | 7.06 | 6.84 | 6.43 | | | 7.03 | | | | |
| H1 lead leg | L | | 22 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | | 144 | | | | | |



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=poseZDX--3Q>

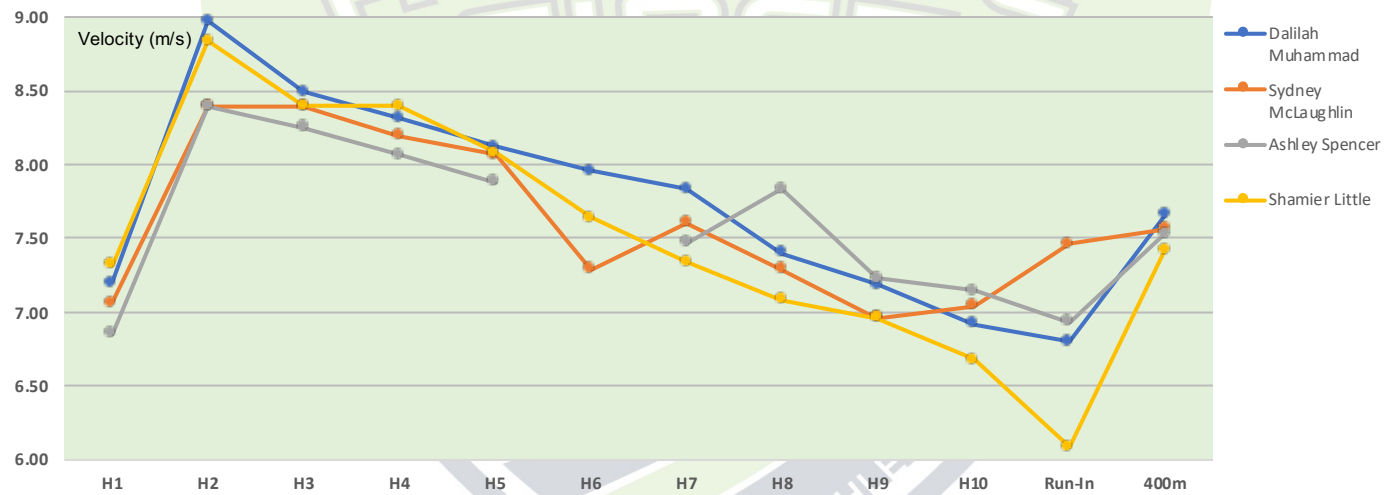
2019 USATF National Championships (Des Moines, IA)

Women's 400m Hurdles

Date 2019.07.28

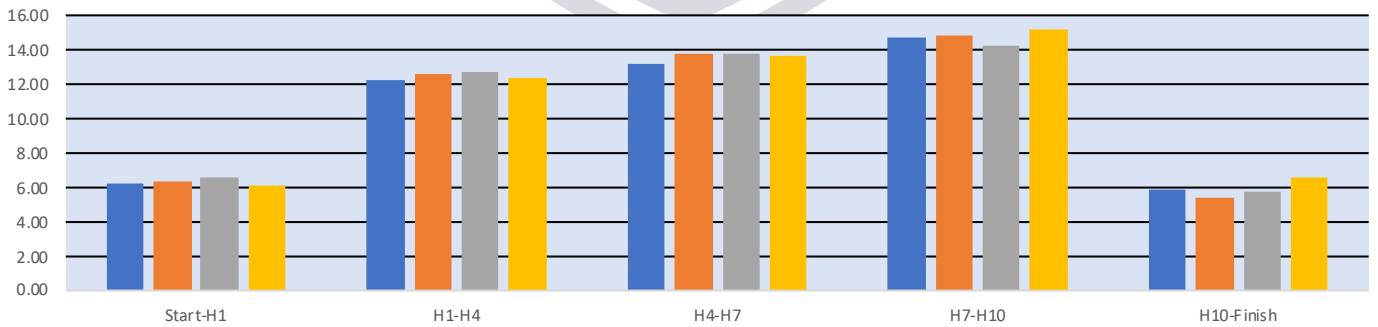
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|------------|--------------|-------|-------|--------|
| Muhammad, Dalilah (USA) (1990) | time | 6.25 | 10.15 | 14.27 | 18.48 | 22.79 | 27.19 | 31.66 | 36.39 | 41.26 | 46.32 | 52.20 | 52.20 | 4 / 1 | | | |
| | reaction time | 0.287 | | | | | | | | | | | | | | | |
| | interval | | 3.90 | 4.12 | 4.21 | 4.31 | 4.40 | 4.47 | 4.73 | 4.87 | 5.06 | 5.88 | WR | | 12.23 | 13.18 | 14.66 |
| | velocity | | 7.20 | 8.97 | 8.50 | 8.31 | 8.12 | 7.95 | 7.83 | 7.40 | 7.19 | 6.92 | 6.80 | 7.66 | | 8.59 | 7.97 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 20 | 181 | | | | |
| McLaughlin, Sydney (USA) (1999) | time | 6.37 | 10.54 | 14.71 | 18.98 | 23.32 | 28.12 | 32.72 | 37.52 | 42.55 | 47.52 | | 52.88 | 6 / 2 | | | |
| | reaction time | 0.198 | | | | | | | | | | | | | | | |
| | interval | | 4.17 | 4.17 | 4.27 | 4.34 | 4.80 | 4.60 | 4.80 | 5.03 | 4.97 | 5.36 | | | 12.61 | 13.74 | 14.80 |
| | velocity | | 7.06 | 8.39 | 8.39 | 8.20 | 8.06 | 7.29 | 7.61 | 7.29 | 6.96 | 7.04 | 7.46 | 7.56 | | 8.33 | 7.64 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| | strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 18.5 | 178.5 | | | | |
| Spencer, Ashley (USA) (1993) | time | 6.57 | 10.74 | 14.98 | 19.32 | 23.76 | | 33.13 | 37.60 | 42.44 | 47.34 | | 53.11 | 3 / 3 | | | |
| | reaction time | 0.202 | | | | | | | | | | | | | | | |
| | interval | | 4.17 | 4.24 | 4.34 | 4.44 | | 9.37 | 4.47 | 4.84 | 4.90 | 5.77 | -PB | | 12.75 | 13.81 | 14.21 |
| | velocity | | 6.85 | 8.39 | 8.25 | 8.06 | 7.88 | | 7.47 | 7.83 | 7.23 | 7.14 | 6.93 | 7.53 | | 8.24 | 7.60 |
| H1 lead leg | L | | | | | | | | | | | | | | | | |
| | strides | 22 | 15 | 15 | 15 | 15 | | | 15 | 15 | 15 | 18.2 | 145.2 | | | | |
| Little, Shamier (USA) (1995) | time | 6.15 | 10.11 | 14.28 | 18.45 | 22.78 | 27.36 | 32.13 | 37.07 | 42.10 | 47.34 | | 53.91 | 5 / 4 | | | |
| | reaction time | 0.198 | | | | | | | | | | | | | | | |
| | interval | | 3.96 | 4.17 | 4.17 | 4.33 | 4.58 | 4.77 | 4.94 | 5.03 | 5.24 | 6.57 | | | 12.30 | 13.68 | 15.21 |
| | velocity | | 7.32 | 8.84 | 8.39 | 8.39 | 8.08 | 7.64 | 7.34 | 7.09 | 6.96 | 6.68 | 6.09 | 7.42 | | 8.54 | 7.68 |
| H1 lead leg | L | | | | | | | | | | | | | | | | |
| | strides | 23 | 14 | 14 | 14 | 14 | 15 | 16 | 16 | 16 | 17 | 21 | 180 | | | | |



Time Intervals (s)

Hurdle Phases



Dalilah Muhammad

Source: Vazel, P.J. (2019). Statistical analysis and historical context of the new 400H world record.

<https://altis.world/articles/statistical-analysis-and-historical-context-of-the-new-400h-world-record/>

2nd - 4th Place (TV Analysis)

Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: Gun Flash

Source: <https://www.youtube.com/watch?v=ZdfDjN4sPbl>

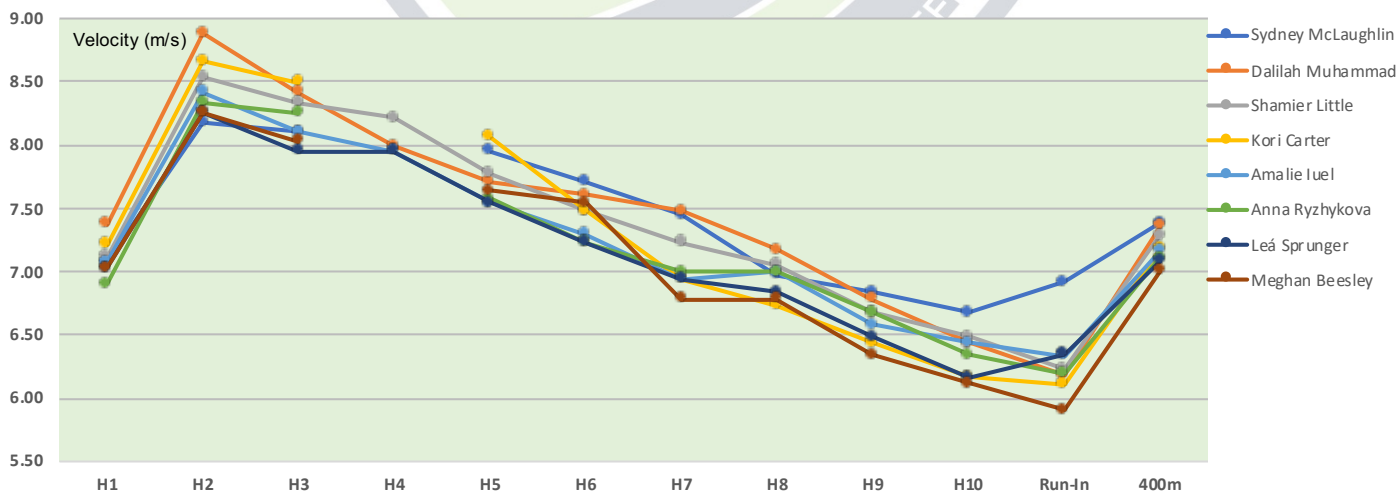
2019 Bislett Games (Oslo, NOR) (TV Analysis)

Women's 400m Hurdles

Date 2019.06.13

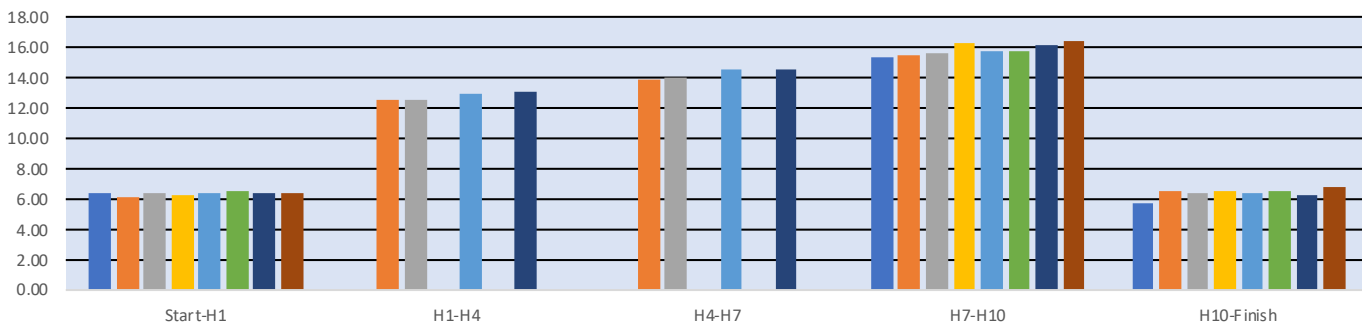
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| McLaughlin, Sydney (USA) (1999) | time | 6.36 | 10.64 | 14.96 | | 23.76 | 28.30 | 33.00 | 38.02 | 43.14 | 48.38 | | 54.16 | 4 / 1 | | | |
| | reaction time | 0.213 | | | | | | | | | | | | | | | 15.38 |
| | interval | | 4.28 | 4.32 | | 8.80 | 4.54 | 4.70 | 5.02 | 5.12 | 5.24 | 5.78 | | | | | 6.83 |
| | velocity | 7.08 | 8.18 | 8.10 | | 7.95 | 7.71 | 7.45 | 6.97 | 6.84 | 6.68 | 6.92 | 7.39 | | | | |
| H1 lead leg | R | | 23 | 15 | 15 | | 15 | 15 | 16 | 16 | 16 | 19 | 150 | | | | |
| Muhammad, Dalilah (USA) (1990) | time | 6.10 | 10.04 | 14.20 | 18.58 | 23.12 | 27.72 | 32.40 | 37.28 | 42.44 | 47.88 | | 54.35 | 5 / 2 | | | |
| | reaction time | 0.205 | | | | | | | | | | | | | 12.48 | 13.82 | 15.48 |
| | interval | | 3.94 | 4.16 | 4.38 | 4.54 | 4.60 | 4.68 | 4.88 | 5.16 | 5.44 | 6.47 | | | 8.41 | 7.60 | 6.78 |
| | velocity | 7.38 | 8.88 | 8.41 | 7.99 | 7.71 | 7.61 | 7.48 | 7.17 | 6.78 | 6.43 | 6.18 | 7.36 | | | | |
| H1 lead leg | R | | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 17 | 20.5 | 181.5 | | | | |
| Little, Shamier (USA) (1995) | time | 6.32 | 10.42 | 14.62 | 18.88 | 23.38 | 28.06 | 32.90 | 37.86 | 43.10 | 48.50 | | 54.92 | 6 / 3 | | | |
| | reaction time | 0.273 | | | | | | | | | | | | | 12.56 | 14.02 | 15.60 |
| | interval | | 4.10 | 4.20 | 4.26 | 4.50 | 4.68 | 4.84 | 4.96 | 5.24 | 5.40 | 6.42 | | | 8.36 | 7.49 | 6.73 |
| | velocity | 7.12 | 8.54 | 8.33 | 8.22 | 7.78 | 7.48 | 7.23 | 7.06 | 6.68 | 6.48 | 6.23 | 7.28 | | | | |
| H1 lead leg | R | | 24 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 20 | 186 | | | | |
| Carter, Kori (USA) (1992) | time | 6.24 | 10.28 | 14.40 | | 23.08 | 27.76 | 32.80 | 38.00 | 43.44 | 49.12 | | 55.67 | 3 / 4 | | | |
| | reaction time | 0.137 | | | | | | | | | | | | | | | 16.32 |
| | interval | | 4.04 | 4.12 | | 8.68 | 4.68 | 5.04 | 5.20 | 5.44 | 5.68 | 6.55 | | | | | |
| | velocity | 7.21 | 8.66 | 8.50 | | 8.06 | 7.48 | 6.94 | 6.73 | 6.43 | 6.16 | 6.11 | 7.19 | | | | |
| H1 lead leg | L | | 23 | 15 | 15 | | 16 | 17 | 17 | 18 | 18 | 20.7 | 159.7 | | | | 6.43 |
| luel, Amalie (NOR) (1994) | time | 6.36 | 10.52 | 14.84 | 19.24 | 23.88 | 28.68 | 33.72 | 38.72 | 44.04 | 49.48 | | 55.80 | 8 / 5 | | | |
| | reaction time | 0.169 | | | | | | | | | | | | | 12.88 | 14.48 | 15.76 |
| | interval | | 4.16 | 4.32 | 4.40 | 4.64 | 4.80 | 5.04 | 5.00 | 5.32 | 5.44 | 6.32 | | | 8.15 | 7.25 | 6.66 |
| | velocity | 7.08 | 8.41 | 8.10 | 7.95 | 7.54 | 7.29 | 6.94 | 7.00 | 6.58 | 6.43 | 6.33 | 7.17 | | | | |
| H1 lead leg | L | | 23 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 19.2 | 181.2 | | | | |
| Ryzhykova, Anna (UKR) (1989) | time | 6.52 | 10.72 | 14.96 | | 24.20 | 29.04 | 34.04 | 39.04 | 44.28 | 49.80 | | 56.26 | 2 / 6 | | | |
| | reaction time | 0.178 | | | | | | | | | | | | | | | 15.76 |
| | interval | | 4.20 | 4.24 | | 9.24 | 4.84 | 5.00 | 5.00 | 5.24 | 5.52 | 6.46 | | | | | |
| | velocity | 6.90 | 8.33 | 8.25 | | 7.58 | 7.23 | 7.00 | 7.00 | 6.68 | 6.34 | 6.19 | 7.11 | | | | |
| H1 lead leg | R | | 22 | 14 | 14 | | 15 | 15 | 15 | 15 | 16 | 21 | 147 | | | | 6.66 |
| Sprunger, Leá (SUI) (1990) | time | 6.40 | 10.64 | 15.04 | 19.44 | 24.08 | 28.92 | 33.96 | 39.08 | 44.48 | 50.16 | | 56.46 | 7 / 7 | | | |
| | reaction time | 0.179 | | | | | | | | | | | | | 13.04 | 14.52 | 16.20 |
| | interval | | 4.24 | 4.40 | 4.40 | 4.64 | 4.84 | 5.04 | 5.12 | 5.40 | 5.68 | 6.30 | | | 8.05 | 7.23 | 6.48 |
| | velocity | 7.03 | 8.25 | 7.95 | 7.95 | 7.54 | 7.23 | 6.94 | 6.84 | 6.48 | 6.16 | 6.35 | 7.08 | | | | |
| H1 lead leg | R | | 21 | 14 | 14 | 14 | 14 | 15 | 15 | 15 | 16 | 16 | 19.2 | 173.2 | | | |
| Beesley, Meghan (GBR) (1989) | time | 6.40 | 10.64 | 15.00 | | 24.16 | 28.80 | 33.96 | 39.12 | 44.64 | 50.36 | | 57.13 | 1 / 8 | | | |
| | reaction time | 0.166 | | | | | | | | | | | | | | | 16.40 |
| | interval | | 4.24 | 4.36 | | 9.16 | 4.64 | 5.16 | 5.16 | 5.52 | 5.72 | 6.77 | | | | | |
| | velocity | 7.03 | 8.25 | 8.03 | | 7.64 | 7.54 | 6.78 | 6.78 | 6.34 | 6.12 | 5.91 | 7.00 | | | | |
| H1 lead leg | R | | 24 | 16 | 16 | | 16 | 17 | 17 | 18 | 19 | 23.5 | 166.5 | | | | 6.40 |



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=763wZ-vc8Bk>

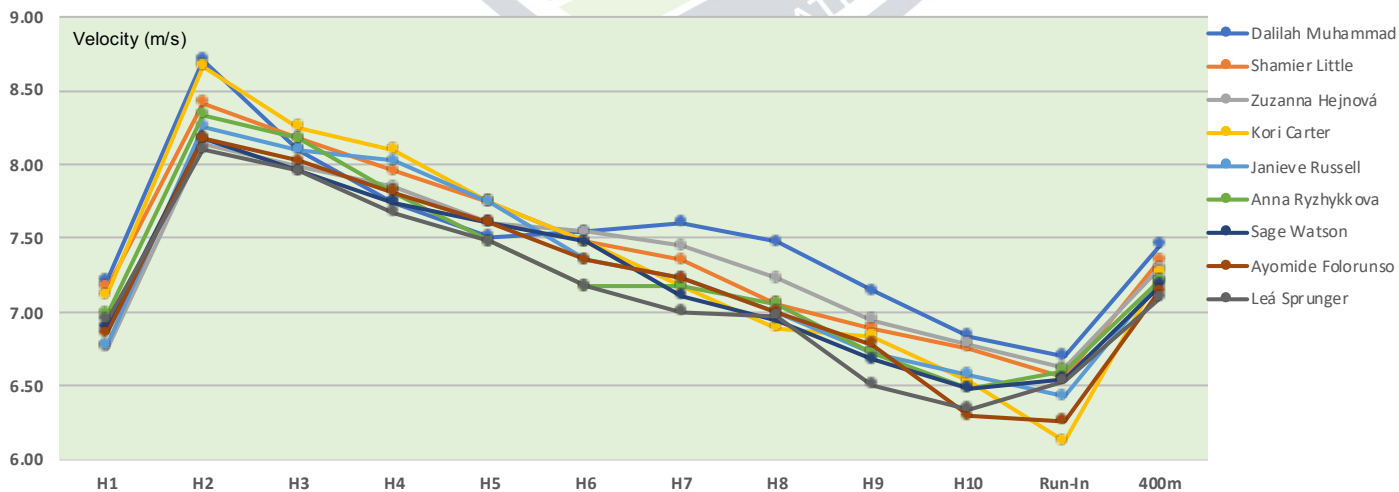
2019 Golden Gala Pietro Mennea (Rome, ITA) (TV Analysis)

Women's 400m Hurdles

Date 2019.06.06

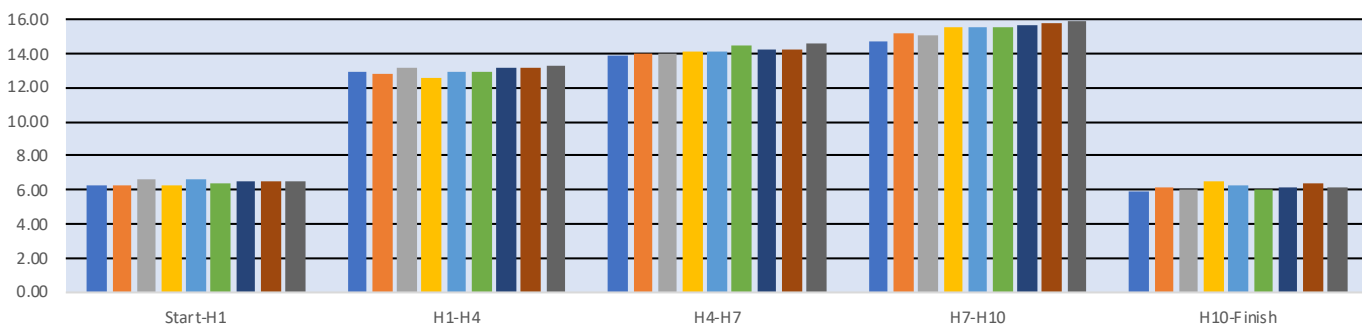
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| Muhammad, Dalilah (USA) (1990) | time | 6.24 | 10.26 | 14.58 | 19.10 | 23.76 | 28.40 | 33.00 | 37.68 | 42.58 | 47.70 | | 53.67 | 5 / 1 | | | |
| | reaction time | 0.147 | | | | | | | | | | | | | | | |
| | interval | | 4.02 | 4.32 | 4.52 | 4.66 | 4.64 | 4.60 | 4.68 | 4.90 | 5.12 | 5.97 | | | 12.86 | 13.90 | 14.70 |
| | velocity | | 7.21 | 8.71 | 8.10 | 7.74 | 7.51 | 7.54 | 7.61 | 7.48 | 7.14 | 6.84 | 6.70 | 7.45 | | 8.16 | 7.55 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Little, Shamier (USA) (1995) | time | 6.28 | 10.44 | 14.72 | 19.12 | 23.64 | 28.32 | 33.08 | 38.04 | 43.12 | 48.30 | | 54.40 | 4 / 2 | | | |
| | reaction time | 0.215 | | | | | | | | | | | | | | | |
| | interval | | 4.16 | 4.28 | 4.40 | 4.52 | 4.68 | 4.76 | 4.96 | 5.08 | 5.18 | 6.10 | | | 12.84 | 13.96 | 15.22 |
| | velocity | | 7.17 | 8.41 | 8.18 | 7.95 | 7.74 | 7.48 | 7.35 | 7.06 | 6.89 | 6.76 | 6.56 | 7.35 | | 8.18 | 7.52 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Hejnová, Zuzana (CZE) (1986) | time | 6.66 | 10.96 | 15.34 | 19.80 | 24.40 | 29.04 | 33.74 | 38.58 | 43.62 | 48.78 | | 54.82 | 7 / 3 | | | |
| | reaction time | 0.162 | | | | | | | | | | | | | | | |
| | interval | | 4.30 | 4.38 | 4.46 | 4.60 | 4.64 | 4.70 | 4.84 | 5.04 | 5.16 | 6.04 | | | 13.14 | 13.94 | 15.04 |
| | velocity | | 6.76 | 8.14 | 7.99 | 7.85 | 7.61 | 7.54 | 7.45 | 7.23 | 6.94 | 6.78 | 6.62 | 7.30 | | 7.99 | 7.53 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Carter, Kori (USA) (1992) | time | 6.32 | 10.36 | 14.60 | 18.92 | 23.44 | 28.12 | 33.00 | 38.08 | 43.20 | 48.56 | | 55.09 | 2 / 4 | | | |
| | reaction time | 0.153 | | | | | | | | | | | | | | | |
| | interval | | 4.04 | 4.24 | 4.32 | 4.52 | 4.68 | 4.88 | 5.08 | 5.12 | 5.36 | 6.53 | | | 12.60 | 14.08 | 15.56 |
| | velocity | | 7.12 | 8.66 | 8.25 | 8.10 | 7.74 | 7.48 | 7.17 | 6.89 | 6.84 | 6.53 | 6.13 | 7.26 | | 8.33 | 7.46 |
| H1 lead leg | L | | | | | | | | | | | | | | | | |
| Russell, Janieve (JAM) (1993) | time | 6.64 | 10.88 | 15.20 | 19.56 | 24.08 | 28.84 | 33.68 | 38.68 | 43.88 | 49.20 | | 55.42 | 3 / 5 | | | |
| | reaction time | 0.173 | | | | | | | | | | | | | | | |
| | interval | | 4.24 | 4.32 | 4.36 | 4.52 | 4.76 | 4.84 | 5.00 | 5.20 | 5.32 | 6.22 | | | 12.92 | 14.12 | 15.52 |
| | velocity | | 6.78 | 8.25 | 8.10 | 8.03 | 7.74 | 7.35 | 7.23 | 7.00 | 6.73 | 6.58 | 6.43 | 7.22 | | 8.13 | 7.44 |
| H1 lead leg | L | | | | | | | | | | | | | | | | |
| Ryzhykova, Anna (UKR) (1989) | time | 6.44 | 10.64 | 14.92 | 19.40 | 24.08 | 28.96 | 33.84 | 38.80 | 44.00 | 49.40 | | 55.46 | 8 / 6 | | | |
| | reaction time | 0.157 | | | | | | | | | | | | | | | |
| | interval | | 4.20 | 4.28 | 4.48 | 4.68 | 4.88 | 4.88 | 4.96 | 5.20 | 5.40 | 6.06 | | | 12.96 | 14.44 | 15.56 |
| | velocity | | 6.99 | 8.33 | 8.18 | 7.81 | 7.48 | 7.17 | 7.17 | 7.06 | 6.73 | 6.48 | 6.60 | 7.21 | | 8.10 | 7.27 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Watson, Sage (CAN) (1994) | time | 6.52 | 10.80 | 15.20 | 19.72 | 24.32 | 29.00 | 33.92 | 38.96 | 44.20 | 49.60 | | 55.71 | 1 / 7 | | | |
| | reaction time | 0.171 | | | | | | | | | | | | | | | |
| | interval | | 4.28 | 4.40 | 4.52 | 4.60 | 4.68 | 4.92 | 5.04 | 5.24 | 5.40 | 6.11 | | | 13.20 | 14.20 | 15.68 |
| | velocity | | 6.90 | 8.18 | 7.95 | 7.74 | 7.61 | 7.48 | 7.11 | 6.94 | 6.68 | 6.48 | 6.55 | 7.18 | | 7.95 | 7.39 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Folorunso, Ayomide (IRA) (1996) | time | 6.56 | 10.84 | 15.20 | 19.68 | 24.28 | 29.04 | 33.88 | 38.88 | 44.04 | 49.60 | | 55.99 | 9 / 8 | | | |
| | reaction time | 0.194 | | | | | | | | | | | | | | | |
| | interval | | 4.28 | 4.36 | 4.48 | 4.60 | 4.76 | 4.84 | 5.00 | 5.16 | 5.56 | 6.39 | | | 13.12 | 14.20 | 15.72 |
| | velocity | | 6.86 | 8.18 | 8.03 | 7.81 | 7.61 | 7.35 | 7.23 | 7.00 | 6.78 | 6.29 | 6.26 | 7.14 | | 8.00 | 7.39 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Sprunger, Leá (SUI) (1990) | time | 6.48 | 10.80 | 15.20 | 19.76 | 24.44 | 29.32 | 34.32 | 39.34 | 44.72 | 50.24 | | 56.36 | 6 / 9 | | | |
| | reaction time | 0.143 | | | | | | | | | | | | | | | |
| | interval | | 4.32 | 4.40 | 4.56 | 4.68 | 4.88 | 5.00 | 5.02 | 5.38 | 5.52 | 6.12 | | | 13.28 | 14.56 | 15.92 |
| | velocity | | 6.94 | 8.10 | 7.95 | 7.68 | 7.48 | 7.17 | 7.00 | 6.97 | 6.51 | 6.34 | 6.54 | 7.10 | | 7.91 | 7.21 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1280 x 720 @ 25fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=LzAyiONcl3U>

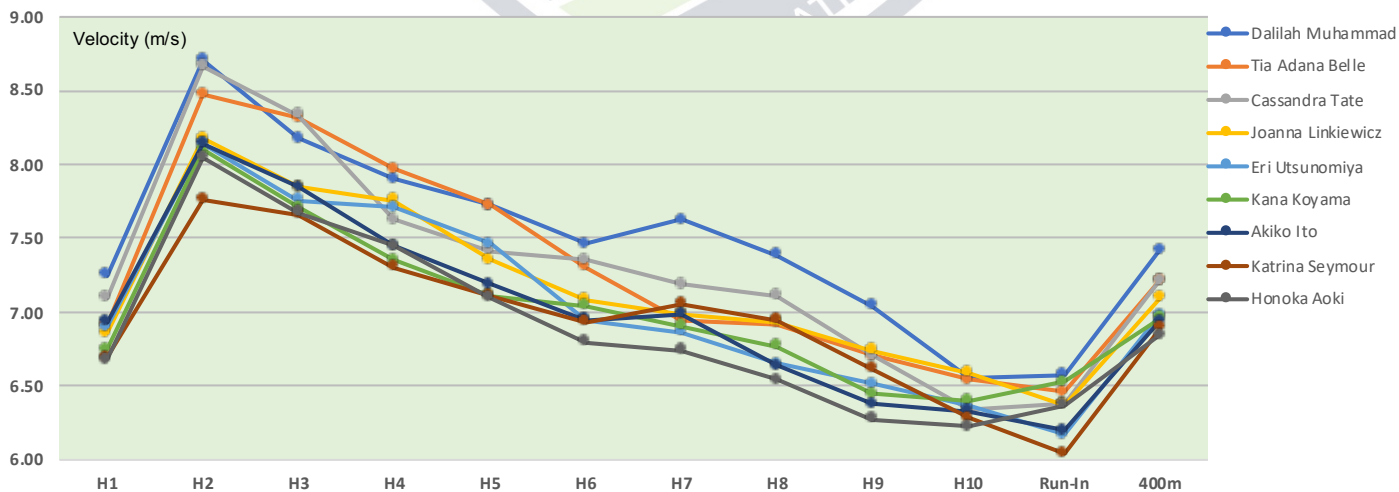
2019 Seiko Golden Grand Prix (Osaka, JPN)

Women's 400m Hurdles

Date 2019.05.19

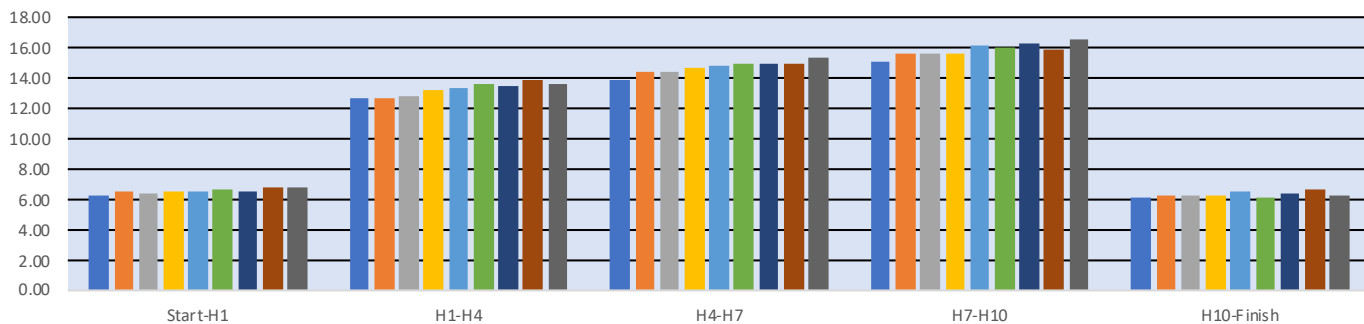
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| Muhammad, Dalilah (USA) (1990) | time | 6.21 | 10.23 | 14.51 | 18.94 | 23.47 | 28.16 | 32.75 | 37.49 | 42.46 | 47.80 | | 53.88 | 5 / 1 | | | |
| | reaction time | 0.181 | | | | | | | | | | | | | | | |
| | interval | □ | 4.02 | 4.28 | 4.43 | 4.53 | 4.69 | 4.59 | 4.74 | 4.97 | 5.34 | 6.08 | | | 12.73 | 13.81 | 15.05 |
| | velocity | | 7.25 | 8.71 | 8.18 | 7.90 | 7.73 | 7.46 | 7.63 | 7.38 | 7.04 | 6.55 | 6.58 | 7.42 | | 8.25 | 7.60 |
| H1 lead leg | R | | | | | | | | | | | | | | | | |
| Belle, Tia Adana (BAR) | time | 6.51 | 10.64 | 14.85 | 19.24 | 23.77 | 28.56 | 33.60 | 38.66 | 43.88 | 49.23 | | 55.42 | 6 / 2 | | | |
| | reaction time | 0.177 | | | | | | | | | | | | | | | |
| | interval | | 4.13 | 4.21 | 4.39 | 4.53 | 4.79 | 5.04 | 5.06 | 5.22 | 5.35 | 6.19 | | | 12.73 | 14.36 | 15.63 |
| | velocity | | 6.91 | 8.47 | 8.31 | 7.97 | 7.73 | 7.31 | 6.94 | 6.92 | 6.70 | 6.54 | 6.46 | 7.22 | | 8.25 | 7.31 |
| H1 lead leg | | | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 139 | | | | | |
| Tate, Cassandra (USA) (1990) | time | 6.34 | 10.38 | 14.58 | 19.17 | 23.89 | 28.65 | 33.52 | 38.44 | 43.66 | 49.18 | | 55.45 | 8 / 3 | | | |
| | reaction time | 0.233 | | | | | | | | | | | | | | | |
| | interval | | 4.04 | 4.20 | 4.59 | 4.72 | 4.76 | 4.87 | 4.92 | 5.22 | 5.52 | 6.27 | | | 12.83 | 14.35 | 15.66 |
| | velocity | | 7.10 | 8.66 | 8.33 | 7.63 | 7.42 | 7.35 | 7.19 | 7.11 | 6.70 | 6.34 | 6.38 | 7.21 | | 8.18 | 7.32 |
| H1 lead leg | | | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 137 | | | | | |
| Linkiewicz, Joanna (POL) (1993) | time | 6.56 | 10.84 | 15.30 | 19.81 | 24.57 | 29.51 | 34.52 | 39.57 | 44.76 | 50.07 | | 56.35 | 7 / 4 | | | |
| | reaction time | 0.112 | | | | | | | | | | | | | | | |
| | interval | | 4.28 | 4.46 | 4.51 | 4.76 | 4.94 | 5.01 | 5.05 | 5.19 | 5.31 | 6.28 | | | 13.25 | 14.71 | 15.55 |
| | velocity | | 6.86 | 8.18 | 7.85 | 7.76 | 7.35 | 7.09 | 6.99 | 6.93 | 6.74 | 6.59 | 6.37 | 7.10 | | 7.92 | 7.14 |
| H1 lead leg | | | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 17 | 17 | 149 | | | | | |
| Utsunomiya, Eri (JPN) (1993) | time | 6.52 | 10.82 | 15.33 | 19.87 | 24.56 | 29.60 | 34.70 | 39.96 | 45.33 | 50.83 | | 57.31 | 9 / 5 | | | |
| | reaction time | 0.167 | | | | | | | | | | | | | | | |
| | interval | | 4.30 | 4.51 | 4.54 | 4.69 | 5.04 | 5.10 | 5.26 | 5.37 | 5.50 | 6.48 | | | 13.35 | 14.83 | 16.13 |
| | velocity | | 6.90 | 8.14 | 7.76 | 7.71 | 7.46 | 6.94 | 6.86 | 6.65 | 6.52 | 6.36 | 6.17 | 6.98 | | 7.87 | 7.08 |
| H1 lead leg | | | 15 | 15 | 15 | 15 | 16 | 16 | 17 | 17 | 17 | 143 | | | | | |
| Koyama, Kana (JPN) (1998) | time | 6.67 | 10.99 | 15.53 | 20.29 | 25.21 | 30.18 | 35.25 | 40.42 | 45.85 | 51.32 | | 57.45 | 3 / 6 | | | |
| | reaction time | 0.173 | | | | | | | | | | | | | | | |
| | interval | | 4.32 | 4.54 | 4.76 | 4.92 | 4.97 | 5.07 | 5.17 | 5.43 | 5.47 | 6.13 | | | 13.62 | 14.96 | 16.07 |
| | velocity | | 6.75 | 8.10 | 7.71 | 7.35 | 7.11 | 7.04 | 6.90 | 6.77 | 6.45 | 6.40 | 6.53 | 6.96 | | 7.71 | 7.02 |
| H1 lead leg | | | 15 | 15 | 15 | 16 | 16 | 17 | 17 | 17 | 17 | 145 | | | | | |
| Ito, Akiko (JPN) (1995) | time | 6.49 | 10.79 | 15.25 | 19.95 | 24.82 | 29.86 | 34.87 | 40.14 | 45.63 | 51.16 | | 57.61 | 2 / 7 | | | |
| | reaction time | 0.141 | | | | | | | | | | | | | | | |
| | interval | | 4.30 | 4.46 | 4.70 | 4.87 | 5.04 | 5.01 | 5.27 | 5.49 | 5.53 | 6.45 | | | 13.46 | 14.92 | 16.29 |
| | velocity | | 6.93 | 8.14 | 7.85 | 7.45 | 7.19 | 6.94 | 6.99 | 6.64 | 6.38 | 6.33 | 6.20 | 6.94 | | 7.80 | 7.04 |
| H1 lead leg | | | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 145 | | | | | |
| Seymour, Katrina (BAH) (1993) | time | 6.72 | 11.23 | 15.80 | 20.59 | 25.51 | 30.56 | 35.52 | 40.56 | 45.85 | 51.42 | | 58.04 | 4 / 8 | | | |
| | reaction time | 0.163 | | | | | | | | | | | | | | | |
| | interval | | 4.51 | 4.57 | 4.79 | 4.92 | 5.05 | 4.96 | 5.04 | 5.29 | 5.57 | 6.62 | | | 13.87 | 14.93 | 15.90 |
| | velocity | | 6.70 | 7.76 | 7.66 | 7.31 | 7.11 | 6.93 | 7.06 | 6.94 | 6.62 | 6.28 | 6.04 | 6.89 | | 7.57 | 7.03 |
| H1 lead leg | | | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 16 | 17 | 141 | | | | | |
| Aoki, Honoka (JPN) (2001) | time | 6.74 | 11.09 | 15.65 | 20.35 | 25.28 | 30.43 | 35.62 | 40.97 | 46.55 | 52.17 | | 58.45 | 1 / 9 | | | |
| | reaction time | 0.167 | | | | | | | | | | | | | | | |
| | interval | | 4.35 | 4.56 | 4.70 | 4.93 | 5.15 | 5.19 | 5.35 | 5.58 | 5.62 | 6.28 | | | 13.61 | 15.27 | 16.55 |
| | velocity | | 6.68 | 8.05 | 7.68 | 7.45 | 7.10 | 6.80 | 6.74 | 6.54 | 6.27 | 6.23 | 6.37 | 6.84 | | 7.71 | 6.88 |
| H1 lead leg | | | 16 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 19 | 156 | | | | | |



Time Intervals (s)

Hurdle Phases



Source: Hirokawa (2019) - research on athlete performance and technique- 2019 data book. Masaaki, S., & Miura, K. (Eds.). p. 74, 75. (in Japanese)
<https://www.jaaf.or.jp/pdf/about/resistn-f2019/07.pdf>

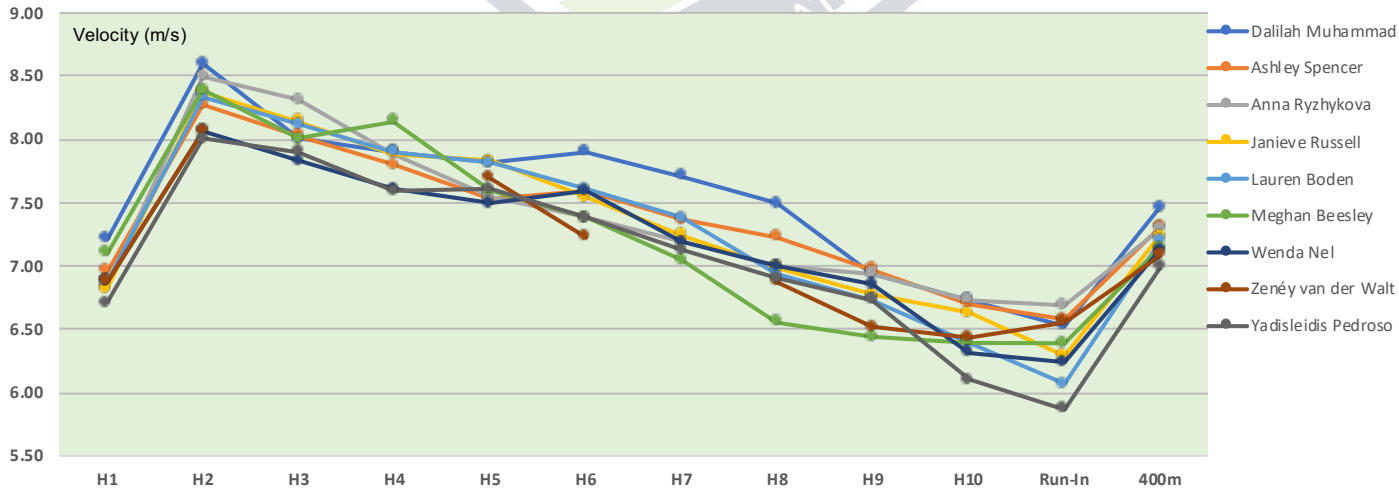
2019 Doha Diamond League (Doha, QAT) (TV Analysis)

Women's 400m Hurdles

Date 2019.05.03

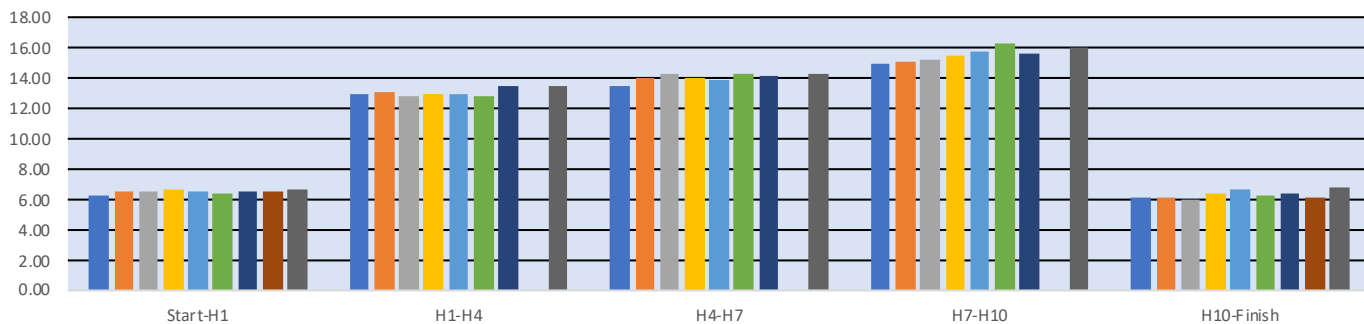
FINAL

| | | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 | Run-In | 400m | Lane / Place | H1-H4 | H4-H7 | H7-H10 |
|--|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|-------|--------------|-------|-------|--------|
| Muhammad, Dalilah (USA) (1990) | time | 6.24 | 10.31 | 14.68 | 19.11 | 23.59 | 28.02 | 32.56 | 37.23 | 42.28 | 47.48 | | 53.61 | 5 / 1 | | | |
| | reaction time | 0.179 | | | | | | | | | | | | | | | |
| | interval velocity | 7.21 | 8.07 | 4.37 | 4.43 | 4.48 | 4.43 | 4.54 | 4.67 | 5.05 | 5.20 | 6.13 | | | 12.87 | 13.45 | 14.92 |
| | H1 lead leg R strides | 23 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 20 | 180 | | 8.16 | 7.81 | 7.04 |
| Spencer, Ashley (USA) (1993) | time | 6.47 | 10.70 | 15.06 | 19.55 | 24.20 | 28.81 | 33.56 | 38.40 | 43.42 | 48.64 | | 54.72 | 2 / 2 | | | |
| | reaction time | 0.156 | | | | | | | | | | | | | | | |
| | interval velocity | 6.96 | 8.27 | 4.36 | 4.49 | 4.65 | 4.61 | 4.75 | 4.84 | 5.02 | 5.22 | 6.08 | | | 13.08 | 14.01 | 15.08 |
| | H1 lead leg L strides | 22 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 19 | 176 | | 8.03 | 7.49 | 6.96 |
| Ryzhykova, Anna (UKR) (1989) | time | 6.58 | 10.70 | 14.91 | 19.35 | 23.99 | 28.73 | 33.60 | 38.60 | 43.64 | 48.84 | | 54.82 | 4 / 3 | | | |
| | reaction time | 0.149 | | | | | | | | | | | | | | | |
| | interval velocity | 6.84 | 8.50 | 8.31 | 7.88 | 7.54 | 7.38 | 7.19 | 7.00 | 6.94 | 6.73 | 6.69 | | | 12.77 | 14.25 | 15.24 |
| | H1 lead leg R strides | 22 | 14 | 14 | 14 | 15 | 15 | 15 | 15 | 15 | 16 | 19.2 | 174.2 | | 8.22 | 7.37 | 6.89 |
| Russell, Janieve (JAM) (1993) | time | 6.60 | 10.78 | 15.08 | 19.52 | 23.99 | 28.63 | 33.46 | 38.47 | 43.64 | 48.92 | | 55.28 | 6 / 4 | | | |
| | reaction time | 0.131 | | | | | | | | | | | | | | | |
| | interval velocity | 6.82 | 8.37 | 8.14 | 7.88 | 7.83 | 7.54 | 7.25 | 6.99 | 6.77 | 6.63 | 6.29 | 7.24 | | 12.92 | 13.94 | 15.46 |
| | H1 lead leg L strides | 23 | 15 | 15 | 15 | 15 | 16 | 16 | 16 | 17 | 17 | 20 | 185 | | 8.13 | 7.53 | 6.79 |
| Boden, Lauren (AUS) (1988) | time | 6.54 | 10.74 | 15.05 | 19.48 | 23.96 | 28.56 | 33.30 | 38.34 | 43.54 | 49.01 | | 55.60 | 9 / 5 | | | |
| | reaction time | 0.147 | | | | | | | | | | | | | | | |
| | interval velocity | 6.88 | 8.33 | 8.12 | 7.90 | 7.81 | 7.61 | 7.38 | 6.94 | 6.73 | 6.40 | 6.07 | 7.19 | | 12.94 | 13.82 | 15.71 |
| | H1 lead leg L strides | 22 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | 17 | 21 | 182 | | 8.11 | 7.60 | 6.68 |
| Beesley, Meghan (GBR) (1989) | time | 6.34 | 10.51 | 14.88 | 19.18 | 23.79 | 28.53 | 33.50 | 38.84 | 44.28 | 49.75 | | 56.01 | 3 / 6 | | | |
| | reaction time | 0.157 | | | | | | | | | | | | | | | |
| | interval velocity | 7.10 | 8.39 | 8.01 | 8.14 | 7.59 | 7.38 | 7.04 | 6.55 | 6.43 | 6.40 | 6.39 | 7.14 | | 12.84 | 14.32 | 16.25 |
| | H1 lead leg L strides | 24 | 16 | 16 | 16 | 16 | 17 | 17 | 18 | 18 | 18 | 22.7 | 198.7 | | 8.18 | 7.33 | 6.46 |
| Nel, Wenda (RSA) (1988) | time | 6.54 | 10.88 | 15.35 | 19.95 | 24.62 | 29.23 | 34.10 | 39.10 | 44.21 | 49.75 | | 56.16 | 7 / 7 | | | |
| | reaction time | 0.206 | | | | | | | | | | | | | | | |
| | interval velocity | 6.88 | 8.06 | 7.83 | 7.61 | 7.49 | 7.59 | 7.19 | 7.00 | 6.85 | 6.32 | 6.24 | 7.12 | | 13.41 | 14.15 | 15.65 |
| | H1 lead leg L strides | 23 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 17 | 18 | 22 | 194 | | 7.83 | 7.42 | 6.71 |
| van der Walt, Zenéy (RSA) (2000) | time | 6.54 | 10.88 | | | 24.52 | 29.36 | | 39.54 | 44.91 | 50.35 | | 56.45 | 1 / 8 | | | |
| | reaction time | 0.167 | | | | | | | | | | | | | | | |
| | interval velocity | 6.88 | 8.06 | | | 7.70 | 7.23 | | 6.88 | 6.52 | 6.43 | 6.56 | 7.09 | | | | |
| | H1 lead leg L strides | 23 | 15 | | | | 16 | | | 17 | 17 | 20.5 | 108.5 | | | | |
| Pedroso, Yadisleidis (ITA) (1987) | time | 6.71 | 11.08 | 15.51 | 20.12 | 24.72 | 29.46 | 34.37 | 39.44 | 44.64 | 50.38 | | 57.20 | 8 / 9 | | | |
| | reaction time | 0.257 | | | | | | | | | | | | | | | |
| | interval velocity | 6.71 | 8.01 | 7.90 | 7.59 | 7.61 | 7.38 | 7.13 | 6.90 | 6.73 | 6.10 | 5.87 | 6.99 | | 13.41 | 14.25 | 16.01 |
| | H1 lead leg R strides | 24 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 17 | 18 | 22 | 194 | | 7.83 | 7.37 | 6.56 |



Time Intervals (s)

Hurdle Phases



Evaluated with: ObjectusVideo

Quality & Frame Rate: 1920 x 1080 @ 30fps

Timing From: First Movement

Source: <https://www.youtube.com/watch?v=cJPqr53A0v0>