Supplementary material for

**Violence in the prehistoric period of Japan: the spatiotemporal pattern of skeletal evidence for violence in the Jomon period**

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Contents

1. Definition of injured individuals
2. Sources of data for injured individuals in the Jomon period
3. On the injured individual at the Kamikuroiwa Iwakage site in the Initial phase

Table

S1. All sites where skeletal remains have been recovered for the Jomon period of Japan and detailed data on the number of individuals discovered

**1. Definition of injured individuals**

We regarded a buried individual as being injured if:

1. A weapon (a knife, a projectile point, a pike, etc.) is embedded in the individual’s bone in the burial, or
2. A bone chip adhered to a weapon found in the burial, or
3. A weapon is found at a place where a bone is thought to have existed in a burial (i.e., an injured bone is inferred to have existed, but has not survived) that included other bones (i.e., we excluded cases where a weapon is found in a burial without *any* bones even if bones are thought to have been present, as there is no way to determine if the weapon was just a grave good), or
4. The injury is impossible without high impact by the deliberate use of a weapon.

**2. Sources of data on injured individuals in the Jomon period**

We sourced data on injured individuals from Yamada (2006) and Uchino (2012). Yamada collected all the available data on buried individuals reported to 2006 (a total of 2,576), though we adjusted Yamada’s number for individuals at Hegi cave by referring to Naito et al. (1987). In addition, we excluded the Itoku site from our data set, because although it may belong to the Final phase of the Jomon in the traditional chronological framework, the existence of agricultural tools indicates that the site actually belongs to the following Yayoi period. The data are for the presence or absence of injury, sex, age (adult/child), site, and period for each individual discovered. Uchino (2012) also collected injured individuals discovered before 2012.

We also used the Comprehensive Database of Archaeological Site Reports in Japan compiled by the Nara National Research Institute for Cultural Properties (http://sitereports.nabunken.go.jp/en) to search relevant site reports. We searched the database using “human bones” as a keyword and found 642 reports for the Jomon period (last accessed: 2015/11/02). Among the reports, only one item on the excavation at the Odake shell midden (Toyama Prefecture Archaeological Research Office, 2014) was not included in Yamada (2006) and Uchino (2012). Thus we added the number of buried individuals at the Odake shell midden to the early phase in our data set. We confirmed that sites in the other 641 reports are included in at least either Yamada (2006) or Uchino (2012).

**3. On the injured individual at the Kamikuroiwa Iwakage site in the Initial phase**

The only injured individual in the Initial phase was found at the Kamikuroiwa Iwakage site. The individual was first identified as a man injured by a bone weapon though recent reexamination revealed that it was a woman and that the implement buried in her hip looks more like an ornament than a weapon, suggesting that she was injured in a ritual soon after her death (Nakahashi 2015). Assuming that to be the case, we find *no* injured bones in the Initial Jomon period, suggesting no evidence for warfare during the Initial and Early phases (a combined span of 6,500 years).

**References**

Naito, Y. (1987) Buried bones at the Hegi cave. In Honyabakei-machi (Ed.), *History of Honyabakei-machi* (in Japanese), (pp. 85-96).

Nakahashi, T. (2015) *Road to the descent of Japanese: on the mysteries of human bones* (in Japanese). Tokyo: Yoshikawa Kobunkan.

Toyama Prefecture Archaeological Research Office. (2014) *Excavation report on the Odake shell midden, No. 3: analyses of the buried bones* (in Japanese).

Uchino, N. (2013). Fighting during the Jomon period as seen from injured bones (in Japanese). *Ritsumeikan Bungaku*, **633**, 472-458.

Yamada, Y. (2006) Burials in the Jomon period: based on examples of buried bones (in Japanese). *Jomon Jidai*, **17**, 73-192. **Table S1. All sites where skeletal remains have been recovered for the Jomon period of Japan and detailed data on the number of individuals discovered**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Initial** |  |  |  |  |  |  |  |
| **Site** | **Total** | **ID** | **Female (adults)** | **Male (adults)** | **Sex unknown (adults)** | **Children** | **Unknown** |
| Higashi Kushiro shell midden | 19 | - | 2 | - | 4 | - | 13 |
| Mukaenodai shell midden | 4 | - | - | - | - | - | 4 |
| Shironodai shell midden | 2 | - | 1 | 1 | - | - | - |
| Oyaji cave | 1 | - | - | - | - | - | 1 |
| Tobinodai shell midden | 2 | - | - | 1 | - | 1 | - |
| Hirasaka shell midden | 1 | - | - | 1 | - | - | - |
| Myoonji cave | 1 | - | - | 1 | - | - | - |
| Tochibara Iwakage site | 12 | - | - | 2 | - | 4 | 6 |
| Ishiyama shell midden | 5 | - | - | - | - | - | 5 |
| Taishaku Kannondo cave site | 2 | - | - | 1 | - | 1 | - |
| Kamikuroiwa Iwakage site | 28 | 1 | 8 | 3 | - | 17 | - |
| Iwashita cave | 17 | - | 3 | 2 | - | 1 | 11 |
| Futsukaichi cave | 8 | - | - | 4 | 1 | 2 | 1 |
| Hegi cave | 11 | - | 1 | 3 | - | 7 | - |
| **Total** | **113** | **1** | **15** | **19** | **5** | **33** | **41** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Early** |  |  |  |  |  |  |  |
| Kotan hot spring site | 4 | - | - | 1 | - | 3 | - |
| Bibi 5 site | 2 | - | - | - | - | - | 2 |
| Kitakogane shell midden | 1 | - | １ | - | - | - | - |
| Furuyashiki shell midden | 1 | - | １ | - | - | - | - |
| Kamisato site | 7 | - | 2 | 1 | 1 | 3 | - |
| Shimizu shell midden | 1 | - | - | - | - | - | 1 |
| Ugasaki shell midden | 1 | - | - | 1 | - | - | - |
| Koude shell midden | 1 | - | - | - | - | - | 1 |
| Kokubu old parade grounds shell midden | 1 | - | - | - | - | - | 1 |
| Kuroya shell midden | 1 | - | - | - | - | 1 | - |
| Mizuko shell midden | 1 | - | 1 | - | - | - | - |
| Utsushiro shell midden | 2 | - | - | 1 | - | 1 | - |
| Oyaji cave | 1 | - | - | - | - | - | 1 |
| Tenjinmae site | 1 | - | 1 | - | - | - | - |
| Odake shell midden | 81 | - | 18 | 34 | 3 | 20 | 6 |
| Kokufu site | 1 | - | - | 1 | - | - | - |
| Ota shell midden | 1 | - | - | - | - | - | 1 |
| Taishaku Anagami Iwakage site | 1 | - | - | - | 1 | - | - |
| Hikozaki shell midden | 10 | - | 3 | 5 | - | 2 | - |
| Yokoo shell midden | 15 | - | - | - | - | - | 15 |
| Shimo Motoyama Iwakage site | 2 | - | - | - | - | - | 2 |
| Iwashita cave | 2 | - | 1 | 1 | - | - | - |
| Todoroki shell midden | 20 | - | 5 | 1 | - | - | 14 |
| Nabatake site | 5 | - | - | 1 | 1 | - | 3 |
| Ninobu shell midden | 1 | - | 1 | - | - | - | - |
| Sobata shell midden | 4 | - | - | - | - | - | 4 |
| Daionji Inari Iwakage site | 8 | - | - | - | - | - | 8 |
| Futsukaichi cave | 1 | - | - | 1 | - | - | - |
| Hegi cave | 39 | - | 14 | 15 | - | 8 | 2 |
| **Total** | **216** | **0** | **48** | **63** | **6** | **38** | **61** |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Middle** |  |  |  |  |  |  |  |
| Kotan hot spring site | 4 | - | 1 | 2 | - | 1 | - |
| Kaitori shell midden | 2 | - | 1 | 1 | - | - | - |
| Miyano shell midden | 3 | 1 | 1 | 1 | - | 1 | - |
| Saibana shell midden | 3 | - | - | - | - | - | 3 |
| Wamura shell midden | 6 | - | - | - | - | - | 6 |
| Izumiyama site | 2 | - | - | - | 1 | - | 1 |
| Akedo site | 2 | - | - | - | - | - | 2 |
| Aoshima shell midden | 25 | 2 | 10 | 10 | - | 5 | - |
| Ohata shell midden | 6 | - | 2 | 4 | - | - | - |
| Chojabara shell midden | 1 | - | - | - | - | 1 | - |
| Sarabo shell midden | 1 | - | - | - | - | - | 1 |
| Karasuhokkomi shell midden | 2 | - | - | - | - | 1 | 1 |
| Ubayama shell midden | 10 | - | 4 | 4 | - | 2 |  |
| Kasori Kita shell midden | 13 | - | 3 | - | - | 3 | 7 |
| Hanazumi shell midden | 1 | - | - | - | - | - | 1 |
| Kainohana shell midden | 5 | - | - | 2 | - | - | 3 |
| Kokuzo shell midden | 1 | - | - | - | - | 1 | - |
| Mukaidai shell midden | 14 | - | - | - | - | 2 | 12 |
| Mukaiaburada shell midden | 1 | - | - | - | - | 1 | - |
| Arayashiki shell midden | 2 | - | - | 1 | - | - | 1 |
| Takanekido shell midden | 8 | 1 | 1 | 2 | - | - | 5 |
| Imashimada shell midden | 2 | - | - | - | - | - | 2 |
| Nego shell midden | 8 | - | 3 | 5 | - | - | - |
| Santanda shell midden | 8 | - | 1 | 3 | 1 | 1 | 2 |
| Yamakura shell midden | 9 | - | 2 | 2 | 1 | 3 | 1 |
| Kowashimizu shell midden | 5 | - | 1 | 1 | - | - | 3 |
| Koyamadai shell midden | 4 | - | 1 | 1 | - | - | 2 |
| Kuriyadai site | 1 | - | 1 | - | - | - | - |
| Nishikata shell midden | 4 | - | - | - | - | - | 4 |
| Sendabori Samukaze shell midden | 8 | - | - | 1 | 1 | - | 6 |
| Chidorikubo shell midden | 8 | - | 2 | 3 | - | 1 | 2 |
| Kurawa site | 2 | - | 1 | 1 | - | - | - |
| Kusakari shell midden | 45 | - | 9 | 9 | 2 | 7 | 18 |
| Murata shell midden | 2 | - | - | - | - | 1 | 1 |
| Kajidai site | 1 | - | - | - | - | - | 1 |
| Nakabyo shell midden | 6 | - | 3 | 2 | - | - | 1 |
| Hasebe shell midden | 1 | - | - | - | - | - | 1 |
| Tsuheiji Minami shell midden | 2 | - | 2 | - | - | - | - |
| Noman Kamiko shell midden | 1 | - | - | - | - | - | 1 |
| Shirai Omiyadai shell midden | 2 | - | - | 1 | - | 1 | - |
| Hishina shell midden | 1 | - | - | - | - | - | 1 |
| Hirahara shell midden | 2 | - | - | - | - | - | 2 |
| Okadaira shell midden | 1 | - | - | - | - | - | 1 |
| Warabitachi shell midden | 9 | - | - | - | - | - | 9 |
| Okawa site | 1 | - | - | 1 | - | - | - |
| Kitamura site | 8 | - | 1 | 2 | - | 1 | 4 |
| Nashikubo site | 6 | - | - | - | - | - | 6 |
| Fujizuka shell midden | 2 | - | 1 | - | - | - | 1 |
| Dono shell midden | 8 | - | 2 | 3 | 1 | 2 | - |
| Awazukotei site | 1 | - | - | 1 | - | - | - |
| Koinosho shell midden | 2 | - | - | - | - | - | 2 |
| Ohashi shell midden | 1 | - | - | - | 1 | - | - |
| Ota shell midden | 69 | - | 8 | 27 | - | 2 | 32 |
| Satogi shell midden | 12 | - | - | 1 | - | 1 | 10 |
| Tsubue Funamoto shell midden | 14 | 1 | 8 | 2 | - | - | 4 |
| Miyashita shell midden | 1 | - | - | - | - | - | 1 |
| Oda shell midden | 2 | - | - | 1 | 1 | - | - |
| **Total** | **371** | **5** | **69** | **94** | **9** | **38** | **161** |

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| **Late** |  |  |  |  |  |  |  |
| Hattaushi 20 site | 2 | - | - | - | - | - | 2 |
| Kotan hot spring site | 10 | - | 1 | 2 | - | 4 | 3 |
| Irie shell midden | 1 | - | - | - | 1 | - | - |
| Misawa 1 site | 46 | - | 1 | 4 | 1 | 5 | 35 |
| Osedo shell midden | 1 | - | - | - | - | - | 1 |
| Kaitori shell midden | 4 | - | 3 | - | - | 1 | - |
| Miyano shell midden | 1 | - | - | 1 | - | - | - |
| Korekawa Nakai site | 4 | - | 1 | 2 | - | - | 1 |
| Yagi site | 1 | - | - | - | - | 1 | - |
| Monzen shell midden | 2 | - | - | 2 | - | - | - |
| Takamatsu shell midden | 1 | - | - | - | - | - | 1 |
| Sanganji shell midden | 2 | - | - | - | - | - | 2 |
| Tagara shell midden | 13 | - | - | 4 | - | 9 | - |
| Ubayama shell midden | 38 | - | 14 | 15 | - | 5 | 4 |
| Kasori Minami shell midden | 22 | 1 | - | - | - | - | 22 |
| Kasori Kita shell midden | 8 | - | 2 | 3 | - | 2 | 1 |
| Kainohana shell midden | 36 | - | 6 | 9 | - | 5 | 16 |
| Gionbara shell midden | 14 | - | - | - | - | - | 14 |
| Miyamotodai shell midden | 32 | - | 4 | 10 | - | 6 | 12 |
| Gongenbara shell midden | 28 | - | 6 | 8 | 1 | 11 | 2 |
| Furuhara shell midden | 1 | - | - | - | - | - | 1 |
| Kosaku shell midden | 40 | - | 11 | 16 | - | 6 | 7 |
| Hirohata shell midden | 1 | - | - | - | - | - | 1 |
| Bandoyama site | 1 | - | - | 1 | - | - | - |
| Mitanda Shijimizuka shell midden | 8 | - | 1 | 1 | - | 1 | 5 |
| Koganezawa shell midden | 3 | - | 1 | 1 | - | - | 1 |
| Koyamadai shell midden | 30 | - | 2 | 1 | 2 | - | 25 |
| Shomyoji shell midden | 12 | - | 3 | 3 | - | 5 | 1 |
| Fukazawa site | 2 | - | - | - | - | - | 2 |
| Shinmei shell midden | 2 | - | 1 | 1 | - | - | - |
| Saihiro shell midden | 32 | - | 18 | 9 | - | 5 | - |
| Soya shell midden | 1 | - | 1 | - | - | - | - |
| Kusakariba shell midden | 4 | - | - | - | - | 2 | 2 |
| Daimon shell midden | 1 | - | - | - | - | - | 1 |
| Tsukijidai shell midden | 1 | - | - | - | - | - | 1 |
| Nakatsuma shell midden | 99 | - | 18 | 43 | 2 | 31 | 5 |
| Nakazawa shell midden | 1 | - | - | - | - | - | 1 |
| Hasebe shell midden | 4 | - | - | - | - | - | 4 |
| Tonohiraga site | 1 | - | - | - | - | - | 1 |
| Fuyuki A site | 4 | - | - | - | - | - | 4 |
| Fuyuki A shell midden | 12 | 1 | - | - | - | 1 | 11 |
| Higashi (shingo) shell midden | 1 | - | - | - | - | - | 1 |
| Minamitsubo shell midden | 3 | - | - | 3 | - | - | - |
| Fukuda shell midden | 1 | - | - | - | - | - | 1 |
| Hirabaru shell midden | 1 | - | - | 1 | - | - | - |
| Toyosawa shell midden | 2 | - | - | 2 | - | - | - |
| Kidosaku site | 2 | - | - | - | - | - | 2 |
| Yahagi shell midden | 13 | - | 5 | 3 | - | 2 | 3 |
| Yoyama shell midden | 5 | - | - | - | - | - | 5 |
| Rokutsu shell midden | 1 | - | - | - | - | - | 1 |
| Miyazaki site | 2 | - | - | - | - | - | 2 |
| Oyokomichi Ue site | 1 | - | - | - | - | - | 1 |
| Kitamura site | 171 | - | 52 | 37 | 4 | 15 | 63 |
| Shimo Numabe shell midden | 1 | 1 | - | - | - | - | 1 |
| Sangu shell midden | 1 | - | - | 1 | - | - | - |
| Ikawazu shell midden | 2 | - | 1 | - | - | - | 1 |
| Kameyama shell midden | 25 | - | 7 | 8 | - | - | 10 |
| Nishi shell midden | 1 | - | - | - | - | - | 1 |
| Kawaji site | 1 | - | 1 | - | - | - | - |
| Irimi shell midden | 3 | - | - | - | - | - | 3 |
| Hayashinomine shell midden | 7 | - | 1 | 3 | - | 2 | 1 |
| Morinomiya site | 6 | - | 2 | 3 | - | 1 | - |
| Yosekura Iwakage site | 42 | - | 10 | 16 | 2 | 7 | 7 |
| Kanda site | 3 | - | - | 1 | - | 1 | 1 |
| Nakatsu shell midden | 1 | - | - | - | - | - | 1 |
| Taishaku Nagoe Iwakage site | 2 | - | - | - | - | - | 2 |
| Hikozaki shell midden | 1 | - | - | 1 | - | - | - |
| Toyomatsu Domen cave site | 12 | - | 3 | 4 | - | 5 | - |
| Satogi shell midden | 9 | - | 1 | 3 | - | - | 5 |
| Hirajo shell midden | 4 | - | - | 1 | - | 2 | 1 |
| Enokizaka shell midden | 1 | - | - | - | - | - | 1 |
| Okinohara site | 11 | - | 4 | 2 | - | 1 | 4 |
| Miyashita site | 5 | - | 1 | 2 | - | 2 | - |
| Kuwabaru Higushi shell midden | 6 | - | 1 | 3 | - | 1 | 1 |
| Saka shell midden | 5 | - | - | 3 | - | 1 | 1 |
| Yamaga shell midden | 18 | - | 7 | 8 | - | 3 | - |
| Nanatsuekakiwara shell midden | 1 | - | - | 1 | - | - | - |
| Wakazono shell midden | 3 | - | 2 | - | - | - | 1 |
| Kojo shell midden | 5 | - | 2 | 1 | - | 2 | - |
| Ishihara shell midden | 1 | - | 1 | - | - | - | - |
| Ono shell midden | 1 | - | - | - | - | - | 1 |
| Futakawa shell midden | 1 | - | - | - | - | - | 1 |
| Muginoura shell midden | 1 | - | 1 | - | - | - | - |
| Hamanshu shell midden | 2 | - | 1 | - | - | 1 | - |
| Bogaki site | 4 | - | - | - | 1 | - | 3 |
| Tateishi shell midden | 4 | - | 3 | 1 | - | - | - |
| Wakimisaki site | 7 | - | - | - | - | - | 7 |
| Hegi cave | 18 | 4 | 2 | 6 | 4 | 4 | 2 |
| **Total** | **944** | **7** | **202** | **250** | **18** | **150** | **324** |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **Final** |  |  |  |  |  |  |  |
| Kyoshun site | 1 | - | - | - | - | - | 1 |
| Takasago shell midden | 29 | - | 4 | 2 | - | 10 | 13 |
| Higashi Kushiro shell midden | 1 | - | - | - | - | - | 1 |
| Midorigaoka site | 1 | - | 1 | - | - | - | - |
| Domancha shell midden | 1 | - | - | - | - | - | 1 |
| Kaitori shell midden | 52 | - | 21 | 13 | 1 | 7 | 10 |
| Tate shell midden | 2 | - | - | 2 | - | - | - |
| Miyano shell midden | 6 | - | - | 4 | - | 2 | - |
| Kumaana cave | 3 | - | - | 3 | - | - | - |
| Korekawa Nakai site | 4 | - | - | - | - | - | 4 |
| Izumiyama site | 2 | - | - | - | - | - | 2 |
| Ohora shell midden | 21 | - | 3 | 8 | - | 8 | 2 |
| Nakazawahama shell midden | 10 | - | - | 1 | - | 2 | 7 |
| Fujikabu shell midden | 1 | - | 1 | - | - | - | - |
| Kashikodokoro shell midden | 8 | - | - | 1 | - | 3 | 4 |
| Akedo shell midden | 13 | - | - | - | - | - | 13 |
| Sanganji shell midden | 33 | 1 | 16 | 12 | - | - | 5 |
| Terawaki shell midden | 1 | - | - | - | - | - | 1 |
| Maehama shell midden | 2 | - | 1 | - | - | 1 | - |
| Chojabara shell midden | 2 | - | 1 | - | - | 1 | - |
| Tagara shell midden | 5 | - | - | 1 | - | 4 | - |
| Nigatsuda shell midden | 2 | - | - | 1 | - | 1 | - |
| Usuiso shell midden | 1 | - | - | - | - | 1 | - |
| Satohama shell midden | 14 | - | 1 | 9 | - | 4 | - |
| Kutsukake shell midden | 1 | - | - | - | - | - | 1 |
| Arami shell midden | 2 | - | - | - | - | - | 2 |
| Saihiro shell midden | 6 | - | 3 | 2 |  | - | 1 |
| Nakatsuma shell midden | 1 | - | - | 1 | - | - | - |
| Noman Kamiko shell midden | 1 | - | - | - | - | - | 1 |
| Ikawazu shell midden | 83 | 7 | 18 | 25 | 3 | 11 | 26 |
| Inariyama shell midden | 56 | - | 11 | 22 | - | 8 | 15 |
| Yoshigo shell midden | 350 | - | 87 | 79 | 2 | 74 | 108 |
| Karekinomiya shell midden | 5 | - | 1 | 2 | - | 2 | - |
| Nishinomiya shell midden | 6 | - | - | 2 | - | 3 | 1 |
| Nishi shell midden | 1 | - | - | - | - | - | 1 |
| Hobi shell midden | 25 | 1 | 8 | 5 | - | 8 | 4 |
| Narumi shell midden | 3 | - | - | 1 | - | - | 2 |
| Shijimizuka shell midden | 31 | - | 3 | 6 | 1 | 2 | 19 |
| Kashihara site | 1 | - | - | 1 | - | - | - |
| Onitsuka site | 2 | - | - | - | - | - | 2 |
| Shigasato site | 35 | - | 8 | 2 | - | 4 | 21 |
| Morinomiya site | 4 | - | - | 3 | - | - | 1 |
| Shorakuji site | 1 | - | - | 1 | - | - | - |
| Kusaka shell midden | 22 | - | 3 | 7 | 1 | 2 | 9 |
| Azuhashiride site | 1 | - | - | 1 | - | - | - |
| Tsukumo shell midden | 66 | - | 27 | 21 | - | 11 | 7 |
| Taishaku Sarugami Iwakage site | 5 | - | 1 | 1 | - | 3 | - |
| Taishaku Nagoe Iwakage site | 1 | - | - | 1 | - | - | - |
| Fukahori site | 1 | 1 | - | 1 | - | - | - |
| Ishihara shell midden | 1 | - | １ | - | - | - | - |
| Nagasakibana shell midden | 1 | - | - | - | - | - | 1 |
| Amatoiwakage site | 1 | - | １ | - | - | - | - |
| Shirahama shell midden | 2 | - | - | １ | - | 1 | - |
| Wakimisaki site | 2 | - | - | - | - | - | 2 |
| **Total** | **932** | **10** | **221** | **242** | **8** | **173** | **288** |