```
┌─────────────────────────────────────────────────────┐
│   Assessed for eligibility based on database (n=1,160) │
│                                                         │
│   ● Breast cancer and another primary cancer (n=407)    │
│                                                         │
│   ● Family history of breast cancer (≥2 relatives) (n=210) │
│                                                         │
│   ● Bilateral breast cancer (n=207)                     │
│                                                         │
│   ● Breast cancer diagnosed at < 40 years old (n=336)   │
└─────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────┐
│   Excluded for unavailable blood samples                │
│                                                         │
│   ● Breast cancer and another primary cancer (n=157)    │
│                                                         │
│   ● Family history of breast cancer (≥2 relatives) (n=41) │
│                                                         │
│   ● Bilateral breast cancer (n=150)                     │
│                                                         │
│   ● Breast cancer diagnosed at < 40 years old (n=252)   │
└─────────────────────────────────────────────────────┘

┌─────────────────────────────────────────────────────┐
│   Finally analyzed by NGS assay (n=496)                 │
│                                                         │
│   ● Breast cancer and another primary cancer (n=250)    │
│                                                         │
│   ● Family history of breast cancer (≥2 relatives) (n=169) │
│                                                         │
│   ● Bilateral breast cancer (n=57)                      │
│                                                         │
│   ● Breast cancer diagnosed at < 40 years old (n=84)    │
│                                                         │
│   ● Two or more risk factors (n=64)                     │
└─────────────────────────────────────────────────────┘
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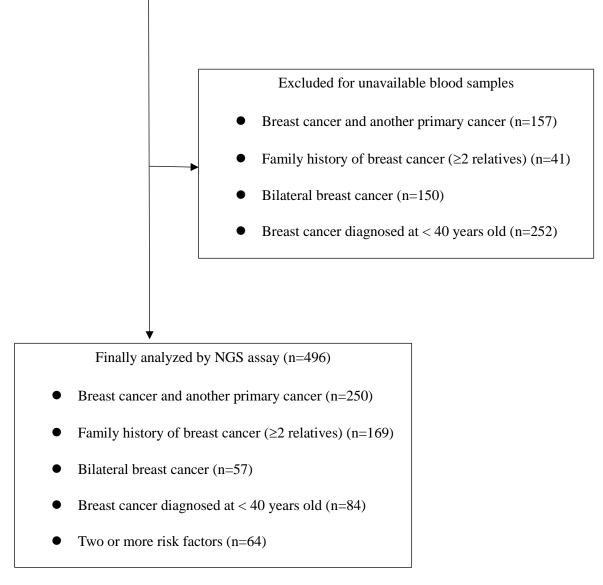
S1 Fig. Consort diagram for selecting patients.